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A TREATISE ON CHOLERA MORBUS:

OR

RESEARCHES

ON THE

SYMPTOMS, NATURE, AND TREATMENT OF THIS DISEASE; AND ON THE DIFFERENT MEANS OF AVOIDING IT.

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PREFACE

BY THE TRANSLATOR.

No era, perhaps, can be cited, in which the feelings of mankind have been more deeply interested than that in which we now live. Whence arises this interest? Suffice it to say, that not only one country, one people, but the entire world have been threatened with destruction. Our alarms have been excited and the most dreadful consequences anticipated from that scourge, which, for a few months past, has desolated some of the finest portions of the earth. Its tour, up to the latest dates, has been steady, progressive, impartial—it respects neither country nor climate, and, in too many instances, it has resisted all the resources of medicine. Then, on what grounds, save those of arrogance and presumption, can *we* reasonably expect to escape a disease, which has already numbered among its victims so many individuals from every circle in life, who perhaps were far more worthy of the mercy of an Omniptoent Being than ourselves.

Every thing, therefore, seems to demonstrate the necessity of understanding the nature of this disease, in order that we may be prepared to combat it by proper treatment, should it invade our country.

With this feeling I was actuated to translate the present Treatise on Cholera Morbus. In the first place, it is the production of one of the most scientific and correct observers in France—and

secondly, it is a fair and unprejudiced account of the disease, from the first moment of its appearance to the present time. He discards hypothesis, and reasons on facts alone. From these he deduces conclusions, which are clear and obvious to the reason of every man, who has no favorite theory to support, and whose mind is untrammelled by prejudice.

Therefore—I say it fearlessly—this book is invaluable, not only on account of the admirable manner in which the subject is treated, but because it illustrates an important truth, which it would be well for medical men to observe—to deal less in hypothesis, and cling more steadfastly to facts.

I am aware that the translation, if examined rigidly, will furnish ample matter for the critic's pen—but I indulge the hope, that when it is stated that three weeks have scarcely elapsed since the work first arrived from France, there will be no disposition to find unnecessary fault.

G. S. Bedford, M. D.

INTRODUCTION.

WILL the Cholera Morbus reach France? What is to be done to prevent its ingress? If it should come among us, in what way is it to be treated? Such are the questions which now agitate the public mind. In order to reply to them, the Government have deemed it necessary to invoke the aid of the Academy of Medicine, and to solicit afterwards the opinion of the Superior Council of Health. The Report of the Academy was somewhat delayed; it required long and difficult researches; that of the Council of Health was soon presented to the Government. The first was drawn up by M. Double, a learned physician and skilful practitioner, who, in innumerable instances, has given proof of his capacity; the second is from the pen of M. Moreau de Ionnès, a distinguished officer, placed in an official situation which procured him a great number of correspondents.

A member of the Committee, appointed by the Academy of Medicine, the 25th January, 1831, for the purpose of collecting documents relative to the disease designated, in India and Russia, under the name of *Cholera Morbus*,* and charged with framing the regulations, demanded by the Minister of Commerce, I had the honor of participating in the labors of this Committee. All members were animated by a spirit of conciliation, sincerely desiring that the public might observe in their union grounds of inspiring hope. Their report was published, after having undergone certain modifications by the Academy, of which the public will judge. The results of the examination by the Superior Council of Health were not associated with it, for they were known to us only through the medium of the public press.

Several portions of this report have not received all the necessary developements, because we were pressed for time. The nature of the disease, for example, and the treatment it requires, have been indicated with that freedom of style which characterises an experienced writer. Untrammelled by prejudice, I will insist principally on these two points. A third will likewise fix my attention—I will demonstrate that sanitory measures are commanded by prudence, but not imperiously exacted by necessity.

The terror occasioned by the mere existence of a dangerous disease in a neighboring country does not require to be fortified by any chimerical theories. We should endeavor to arrive at a knowledge of the facts, deduce conclusions from them, and resolve upon the course to be pursued in order to

* This Committee was then composed of MM. Keraudren, Chomel, Desportes, and myself; afterwards, MM. Desgenettes, Double, Marc, Dupuytren, Pelletier, Louis, and Emery, were made part of it, and M. Double was appointed Secretary. On the 30th August, an honorable colleague, M. Itard, united with us in our researches.

protect ourselves against the disease; let every thing else be abandoned to the vain discussions of the schools, and let us not endeavor to give them an importance which certainly they do not merit.

No one, more than myself, can respect the honest convictions of the heart; but the mind itself is subject to error, and sometimes it is apt to exaggerate. In a country of liberty, nothing should be done without just motives, but these are never to be misrepresented. Truth should govern mankind, for it alone will conduct them to correct results. I have endeavored to make myself intelligible to every one, for the question now under consideration interests the whole world. At a time like the present, individuals even who are strangers to our profession, feel interested in the perusal of medical works; they should, therefore, be written in a manner which will allow them to be read with advantage.

Certain words will frequently appear in this treatise, and therefore, I consider it necessary to explain in what sense they will be employed.

Sporadic refers to a disease which attacks but one individual, or which exists among a small number of persons scattered throughout the same country.

Epidemic relates to a disease which destroys a large number of inhabitants in the same country.

Contagious is applied to a disease which may be contracted, either by contact with the patient, his clothes, articles of merchandise coming from his person, or merely from the country which he inhabits. Consequently, every disease of this kind is transportable, or, as it is said, importable from one country into another.

It is evident that the exact signification of these three definitions is not perfectly determined. The third, especially, conceals at least four secondary views, united under the general idea of a morbid state, which becomes itself the cause of disease, through the medium, either of the person affected, or of that which was in contact with him, or of that which he has touched, or finally of that which was exposed to the air he expired.

The *Importation*, that is, the transportation from one country to another, of diseases or their determinate causes, may be effected in different ways, all of which deserve attention.

The sense of these different terms is so speculative, that when a disease manifests itself in one patient, we cannot decide whether it will prove merely sporadic, that is, whether it will be confined to the individual affected, whether it will attack but a small number of persons, or whether in fact it will be epidemic, that is, affect a large portion of the population. We do not know if it will be transmissible, and consequently, whether it will be importable. Yet more—not only during the epidemic, but after it has ceased, physicians have often been undecided as to its contagious, transmissible, or importable character.

When a disease declares itself in a large number of individuals in the same country, it is certainly *epidemic*, since this word signifies literally, *that which is*

in the midst of the people, which circulates among the people;* but certain authors object to the term epidemic applied to diseases, which affect a great number of persons by contagion; and apply it merely to such general maladies as are exempt from contagion. The consequence of this innovation would be that we could no longer consider variole or the plague as epidemic—an evident absurdity.

It is true that the ancients and their disciples understood by the term epidemic, a disease induced by the state of the atmosphere; but this restriction cannot be preserved; otherwise, we should be compelled, conformably to the theory on which they sustained themselves, to suppose, with the ancients, that this condition of the air, which they considered the cause of epidemics, consists in the impurities of the atmosphere and the changes which it undergoes, in consequence of being influenced by the stars.†

Let us therefore consider the term epidemic in the sense adopted by the venerable Pinel, and let us repeat, after Professor Desgenettes, that an epidemic is a disease, which accidentally prevails among a great number of individuals, as the effect of a momentary increase in the activity of the deleterious or morbid causes existing in the country which they inhabit, or in consequence of causes foreign to the country.‡

In order to avoid the sterile discussions which the terms *contagion* and *contagious* have occasioned, we will ordinarily employ those of *transmission* and *transmissible*, which at least offer nothing equivocal. We will, moreover, examine the questions relating to the transmissibility of diseases in general, and to that of Cholera Morbus in particular, through the medium of the air, by the contact of men, or any articles of merchandise, &c.

M. Double has embraced, under the name of *épidémies catastatiques*, or *petites épidémies*, those which attack a small number of persons, at the same time or successively, during a short period, and which nevertheless may be denominated *sporadic*, without forcing the etymological signification of the word.§

By the term *endemic,* we understand those diseases which prevail habitually in a country, during a part or the entire year, or which re-appear at fixed or irregular periods. The importance of distinguishing between an endemic and epidemic disease can be readily conceived. This distinction is not always easy, particularly when it is to be made by persons unaccustomed to correct observation.

All this is not, as may be supposed, a pure discussion of words, for errors of observation and judgment occasion inaccuracies in language, and these, in their turn, create errors, not only in theory, but, what is still worse, in practice.

* *επι*, among; *δημοσ*, populus.

† Fernel, Universa Medecina, tom. ii. page 496.

‡ Encyclopèdie Moderne, tom. xii. p. 16.

§ Derived from the Greek of *σποραο*.

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A

TREATISE

ON

CHOLERA MORBUS.

CHAPTER I.

SYMPTOMS OF CHOLERA MORBUS.

Sporadic Cholera Morbus has been observed by physicians of all ages and countries. For several centuries, it was considered in Europe, as an endemic disease of the East Indies. Compared with other acute maladies, it is rarely epidemic. In order to arrive at a correct knowledge of its symptoms, we have no other mode than that of examining the phenomena observed in isolated cases and epidemics, the history of which has been transmitted to us by different authors.

In the fifth book on epidemics by Hippocrates, we find the following in relation to Cholera:

A citizen of Athens was seized with Cholera; he vomited and evacuated his bowels with pain; nothing could arrest these evacuations; he lost his voice, and was unable to raise himself from his bed; his eyes were dull and the orbits hollow; the belly and intestines were agitated with convulsions; there was hiccough. The alvine discharges were more abundant than the vomiting. The patient took some Hellebore, in a decoction of lentils, drank as much as he could of this decoction, and then ejected it from his stomach. In fine, the vomiting and intestinal evacuations were arrested. He complained of being cold, and had a hip-bath administered to him, which succeeded in producing a general warmth. On the following day, he was relieved, and took a light bouilli.*

* Paragraph v., ed. van der l. Naples, 1757, in 4to, vol. 1.

Bias, a wrestler, possessed of a voracious appetite, was attacked with bilious vomiting and purging, in consequence of having eaten some viands, particularly fresh pork, cakes, pastry, cucumbers, melons, milk, and bouilli, and also having drunk aromatic wine. It is in summer that we observe bilious affections.*

Eutychides, in consequence of a bilious complaint, experienced cramps in his legs and vomiting; for three days and nights he evacuated a considerable quantity of highly colored bile, ; having fallen into a state of weakness and anxiety he could retain neither drinks nor aliments; his urine was scanty, and voided with great difficulty. He vomited and discharged per anum a species of fecula.†

The seventh book of the same work contains the following table of the causes of Cholera Morbus :—

The evacuation of bile upwards and downwards arises from the use of viands, principally fresh pork, chick-peas, an excess of old aromatic wine; cuttle fish and lobsters; vegetables, chiefly leeks, onions, all sorts of cooked lettuce, cabbage, and raw sorrel; cakes, pastry, fruits, cucumbers, melons; wine mixed with milk, vetches, and bouilli. Bilious affections occur most frequently in summer.‡

The evacuation of bile by vomiting and alvine dejections is observed in persons who have passed their youth.||

The lipyrien fevers cannot be cured, unless there be evacuations of bile upwards and downwards.§

This is all that antiquity affords respecting the Cholera, under the revered name of Hippocrates. These different passages were, hertofore, badly translated. But we have endeavored to give them a more accurate version.

The first observation is complete, except the indications of the causes of the disease; the symptoms leave us nothing to desire; the treatment, nearly conformable to the maxim of treating by *contraria*, is remarkable. The patient was cured.

The second observation does not mention the issue of the disease, which was probably favorable. The cause is indicated in detail. No mention is made of the treatment. Perhaps, there was none employed. Frequently, this affection does not require any treatment. Remark, that the author, in order to complete

* The author adds: "and intermittent fevers." Paragraph xxvi.

† Paragraph xxix.

‡ Paragraph xl.

|| Aph. liv. iii. 30.

§ *Coac*, liv. i. 126.

the character of the disease, tells us that these affections are most frequent in the summer season. It is an additional feature, a general remark when speaking of a particular case.

The third observation contains several additional symptoms: the cramps in the legs, reddish color of the bile, debility, anxiety, obstinate ejection of aliments and drinks, scantiness and difficulty of the urinary excretion, and in fine the sort of fecula discharged upwards and downwards. Neither the treatment nor result of the disease is stated. It appears that death must have been the effect of a Cholera Morbus so intense.

Can these three observations, scattered in the midst of a number of others, disposed without any order or connection, collected in Elide, Œniade, Athens, Larissa, Pheres, be considered as epidemic cases? It is impossible to reply to this question. It is said that the Cholera Morbus prevails in summer; three cases of this disease are reported in a section in which no other affection occurs so frequently: whence we are authorized in believing that Cholera Morbus was not uncommonin Greece, particularly during the warm season.

The aphorism, which ranks the Cholera among the diseases of advanced age, has been to a certain degree confirmed by observation.

The sentence taken from the *Prènotions Coaques*, refers only to the febrile Cholera Morbus. However, F. Hoffman has not erred in applying it to Cholera Morbus, for the febrile form of this affection ought not to be excluded from its history.*

In the seventh book, there are no isolated observations, nor general remarks attached to any one of them; there is merely a recapitulation of the causes of bilious affections, according to the observations cited in the fifth book, and no doubt according to others not mentioned.†

Among these causes, there is one which the reader should bear in mind; it is the use of the flesh of pork: we shall allude to it in the course of this work.

If we unite the symptoms mentioned in the three observations of which we have just spoken, we shall have for the characteristic

* De Cholera, in op. omn. tom iii., page 165.

† It has been supposed that it was intended to speak here of the *irruptions of bile in Cholera,* which induced belief that *Cholera* was due to *intestinal,* rather than to *hepatic evacuations.* Be this as it may, the term *Cholera* is derived from χολη-ρεω, a flowing of bile, and from χολασ-ρεω an intestinal flux. *J. M. Good* remarks, with good reason, that it is unnecessary to add the word *Morbus* to that of *Cholera*, since this denomination conveys the idea of disease. (Study of Medicine: London, 1825, tome v. page 261.)

phenomena of Cholera Morbus: vomiting and dejections of bile, pain, weakness of the voice, debility, hollowness of the orbits and dull aspect of the eyes, abdominal convulsions, hiccough, cold, cramps in the legs, reddish color of the bile, anxiety, scanty and difficult micturition, in fine the evacuation upwards and downwards of a sort of fecula.

The author does not mention any fact relative to an unfavorable prognosis, whence we are led to conclude that the Cholera was rarely fatal among the Greeks; for we know with what care they have indicated the signs of approaching death in acute diseases, and especially in febrile affections. It will be seen, however, that Areteus of Cappadocia has stated those cases in which Cholera terminates fatally, at the same time that he speaks of them when treating of the most ordinary acute maladies, which leads us to believe that this affection was more common among the Greeks than it has yet been among us.

According to Celsus, the matter evacuated by the intestines and stomach in Cholera is aqueous; it afterwards resembles the washings of meat, sometimes white, sometimes black, or of a varied aspect; the intestines swell and are painful; the legs and hands frequently contract, the thirst is urgent, and the patient faints away. When all these symptoms are united, we must not be astonished if the patient dies suddenly. However, the author mentions this disease as one most easy to cure.*

The symptoms of diseases mentioned rather than described in the works of Hippocrates, or at least in such as bear his name, are found united in tables remarkable for their accuracy in those of Areteus of Cappadocia. The Cholera, says he, a very acute disease, consists in a retrograde movement of matter, which flows from all parts of the body into the œsophagus, stomach, and intestines. That which is accumulated at the orifice of the stomach and in the œsophagus is expelled by vomiting; that which floats in the stomach and intestines is evacuated downwards. The first, which is ejected by vomiting, is similar to water; that which passes through the intestines is stercoratious, liquid, and of a fetid odour. If its evacuation be provoked by lavements, it is at first mucous, then bilious. At the commencement, the disease is slight and without pain, then painful feelings are experienced about the heart, along the œsophagus, and in the abdomen. If the disease becomes aggravated and the pains increase, the patient faints away, the muscles are without force,

* Lib. iv., cap. xi.

there is an invincible repugnance to food, and the patient becomes alarmed. Should the disease arrive at its highest degree, the body becomes inundated with perspiration, black bile is evacuated upwards and downwards; the bladder, laboring under a spasmodic action, retains the urine, which is not very abundant, on account of the flow of fluids towards the intestines; the voice becomes lost; the pulse is small and very frequent; the patient makes continual but vain efforts to vomit; and he experiences severe griping without any alvine evacuation; death occurs in the midst of acute pains, convulsions, a feeling of suffocation, and unavailing efforts to vomit. This disease, adds Areteus, occurs principally in summer, sometimes in autumn, less often in spring, and but rarely during winter. It attacks in preference young persons, and especially the more vigorous, and seldom individuals advanced in age: it affects children rather than old men, but then it is not mortal.

Notwithstanding the general accuracy of the writings of Areteus, yet we observe that he at times allows conjecture to mingle with his reasoning in reference to Cholera. He states that the bile appears only in the second stage, when the alvine discharges have been provoked, or at the moment in which the disease has attained its greatest severity. The perspiration is indicated; Hippocrates has not made mention of it. For the first time, the smallness and extreme frequency of the pulse are remarked, as likewise the unavailing efforts to vomit and evacuate the bowels: these efforts, together with the convulsive movements, are mentioned as the phenomena of approaching death. The sensation of suffocation is also a character which Hippocrates has not noted, but which Areteus, as also those we have just cited, has observed himself or collected from the writings of authors whose names have not reached us.

Areteus is the first who has spoken of Cholera in relation to the different ages, and strength of the constitution; he has in a very judicious manner treated of its connection with the seasons.

Cœlius Aurelianus mentions, among the causes of Cholera, the abuse of wine, of warm water, and the sojourn on board a ship at sea of persons who are unaccustomed to the continual motions, which they then experience. A sentiment of tension, of weight in the epigastrium, anxiety, restlessness, wakefulness, pains in the intestines with borborygms, eructations, flatulence, nausea, a flowing of the saliva, a sensation of lassitude in the extremities and thorax, indicate the disease which as yet is only threatened. It declares itself by an ejection of aliments but half digested, and of yellow, green, and sometimes black bile. In proportion as the

disease increases, the vomiting of this dark liquid is prolonged, and sometimes produces the discharge of matter similar to the washings of meat. It is at times mucous and whitish. The pulse is hard, the articulations cold, the face livid, the heat *in epigastrio* and thirst insupportable, the respiration short and frequent, and the extremities undergo involuntary contractions. The pain extends from the epigastrium to the superior part of the chest, and towards the iliac regions. The dejections are sometimes bloody. The visage becomes emaciated, the eyes redden, and hiccough ensues. The ancients assure us that this disease never reaches the second day. When a salutary change occurs, the cold in the articulations diminishes, the pulse raises, the evacuations become less abundant and more rare, and the strength is gradually restored. The vomiting and dejections, with contraction of the limbs, are separated by intervals of calm, or at least by a diminution of the symptoms.

This disease, adds Cœlius Aurelianus, is generally violent—acute; it results from a spasm announced by pains in the epigastrium, abdomen, and intestines, and by stiffness of the articulations. According to him, although the stomach and intestines suffer in this disease, the whole body sympathizes.*

Alexander of Tralles has not described the Cholera; he merely remarks that it is a very acute disease with profound syncopy and excessive prostration, and that it should be treated with celerity. This disease, according to him, does not depend upon one cause alone, but upon several; it is produced especially by an excess of aliments, owing to their sweet, greasy, or oily nature. He also mentions an excess of bile, a chilling of the body by cold applications or drinks, as being capable of producing it.†

These extracts will suffice to demonstrate that Cholera is among those diseases, which the ancient Greek and Roman physicians were best acquainted with; that its frequency and severity were understood by the fathers of our science, and that they only needed autopsical examinations, in order to complete the description of the phenomena characterising this disease. We perceive that each observer adds something to this table.

Let us now examine what has resulted from the researches of modern times.

"Zacutus Lusitanus, says M. Ozanam, reports that in 1600, a colic prevailed in France called *trousse-galant*, which was so terrible, that all those attacked by it died ordinarily before the fourth day." This colic is given by M. Ozanam, as an example

* *Acut. Morb.*, lib. iii. c. xviii. † Page 295.

of the first epidemic Cholera in Europe. The fact is, Zacutus did not commit this error.* In his treatise *De praxi Medica admiranda*, book 2, observation 23d, passage cited by M. Ozanam, he speaks, it is true, of a pestilential, contagious, and mortal colic, which prevailed in 1600, throughout nearly the whole of Europe, but far from confounding it with cholera, he mentions, two pages higher, in numbers 16 and 17, two cases of accidental cholera, treated with success. One was the case of a woman who, having eaten some rice and milk, experienced copious and repeated vomiting and alvine dejections, syncopy, excessive thirst, convulsions, stiffness in her limbs, contractions of her muscles, particularly in the calf of her leg, stupor, dimness of vision, coldness of the extremities, anxiety, and distress; the pulse became insensible, and the countenance expressed the image of death. The second was that of a thin and emaciated old man, who, during the most intense heat of summer, after having eaten an excessive quantity of melon, in the space of three days, vomited a hundred times a mucous and fetid matter, and went nearly three hundred times to the *garde-robe*, excreting a liquid and white phlegm; his thirst was insupportable, obstinate wakefulness, pulse intermittent, irregular, sometimes insensible, loathing extreme, voice nearly extinct; in addition, he had hiccough, convulsive movement of the inferior limbs, coldness of the extremities, hot and rough tongue, no excretion of urine; in fine, delirium, distress, syncopy, and an almost entire annihilation of strength.

In the last book of his *praxis historiarum*, observation 3d, which has not been cited by M. Ozanam, Zacutus remarks that, among the infinite number of persons affected with cholera, not one, to his knowledge, died. On this occasion, he states that at Lisbon, a veteran, of feeble health, after having passed the night in the open air without sleeping, and having eaten a large quantity of unripe fruit and fried eggs, and drunk a very cold beverage, retired to rest; he soon awoke in consequence of uneasiness in the stomach, and pains above the pubis, and vomited an enormous quantity of an aqueous humor; the pulse was irregular, concentrated, profound, intermittent; swooning and convulsions ensued; in two days he had three hundred alvine dis-

* M. Ozanam has a number of other errors in his History of Epidemics, relative to Cholera Morbus; he goes so far as to designate under this name, diseases characterized by vomiting and constipation. We cannot but be surprised and afflicted to see men of merit, copy servilely, such egregious mistakes, without even indicating the source from which they unfortunately derived them.

charges, and sixty ejections from his stomach; extreme palor, almost insensible pulse, and interrupted respiration. Notwithstanding this alarming assemblage of symptoms, the patient recovered. Zacutus adds, that, nevertheless, we must not treat this disease lightly; that, slight in Portugal and Amsterdam, it produces very sudden death in the greater number of those it attacks in the East, where it is called *mordexi;* that it is very fatal in Mauritiana and Arabia; and that Arabs frequently contract it because they are in the habit of eating a paste scarcely baked, honey, bread and oil.

Jacob Bontius, a physician of Holland, has left us a chapter on Cholera, which he had occasion to observe at Batavia in 1629. He places this disease among those that prevail commonly in India. It is, says he, a very acute disease; its principle cause besides the heat and humidity of the atmosphere, is the abuse of fruits. This excretion proves salutary to certain persons, because, it is said, that it expels deleterious matter from the system; but it is accompanied by such prostration of strength, heat, and life, that the majority of patients expire in the space of twenty-four hours, and even in less time; as was the case, among others, with Corneille Van Royen, steward of the hospital, who, in good health at six in the evening, was attacked suddenly by Cholera, and died before midnight, vomiting and going at the same time to the *garde-robe* with excruciating pains and convulsions, notwithstanding the celerity that was employed to render every possible assistance. However, if the patient lives beyond twenty-four hours, there will be great hope of recovery. The pulse is very weak; respiration difficult and laborious; the extremities cold; a burning heat is felt internally; ardent thirst and continual wakefulness; excessive agitation, and if it be accompanied by cold and fetid perspiration, we may be assured that death is at hand. The patients almost all die in convulsions.

Notwithstanding the imperfections and omissions of this description, it is easy to perceive that the disease observed by Bontius in India was nothing more than the Cholera of the Greeks.

In 1669, observes Thomas Sydenham, the legitimate Cholera prevailed in London, and I do not remember of having seen it in any other year. This disease, he continues, occurs almost constantly at the end of summer and the approach of autumn. This Cholera, returning at certain seasons, was, according to him, different from that which may occur at any period of the year, in consequence of excess in eating and drinking, although, inhis opinion, both have nearly the same symptoms, and require to be treated after the same manner.

These symptoms are, excessive vomiting and dejections of corrupted matter, with violent intestinal pains, swelling and tension of the abdomen, cardialgia, thirst, heat, anxiety, frequent pulse, often small and irregular, tormenting nausea, sometimes colliquative perspiration, contractions of the arms and legs, fainting, coldness of the extremities, and frequently death in twenty-four hours.*

As epidemic as the legitimate Cholera may be, adds Sydenham, we very rarely see it pass the month of August, in which it commences; it scarcely ever extends beyond the first weeks of September, although fruits are abundantly used until the end of this month; whence this author concludes that the atmosphere in the month of August possesses some peculiar quality which, by acting on the stomach, tends to the production of this disease.

In addition, he remarks, that a species of Cholera frequently attacks children, and proves fatal to many of them, at the period of dentition or when they begin to swallow food.

The Cholera, which Sydenham attributes to the state of the atmosphere during the month of August, and to the abuse of fruits, is manifested by the same symptoms as the Cholera of the Greeks, and consequently as that of India. The distinction, more theoretical than practical, established by the English Hippocrates between this epidemic Cholera, which he calls legitimate, and that occurring at any season in consequence of individual causes, and which is termed sporadic, does not merit much attention, because he himself remarks that the treatment is similar in both cases.

Frederick Hoffman has reported several cases of sporadic Cholera which he collected in Germany, the details of which it will not be unprofitable to mention here.†

A vigorous soldier, aged 40 years, after a fit of anger, the air being cold and humid, drank with rapidity a large quantity of sweet wine. The next day, loathing of food, efforts to vomit, general contusive pain; suddenly, violent and abundant ejections of bilious, greenish matter, with excessive agitation, great anxiety about the heart, incessantly followed by alvine discharges together with excruciating pain in the bas-ventre. Notwithstanding the stomachic, anodyne, vigorous, and diluting treatment, the patient had been tormented for four days by the violence of the pains, his strength was exhausted, and his situation truly desperate; experiencing ardent thirst, he swallowed some cold water, which at first was discharged through his bowels accompanied by great pain, but having continued the use of it, the colic ceased,

* Oper. Omn. † De Cholera, in Op. Omn.

and the dejections became less frequent; the skin, hot as it was before, became soft and humid; sleep and strength returned—and the patient recovered.

A nobleman, aged 40 years, possessing a good constitution, inclined to anger, given to the excess of wine, and formerly subject to tertian agues and nasal hermorrhages, was attacked for several years, towards the spring equinox, either with a tertian ague, or an erysipelatous affection of the right foot; besides, every summer principally, he was suddenly seized with Cholera, when he gave way to anger after a copious repast. Hoffman cured him by the use of milk-whey, a moderate regimen, and warm baths.

A countess, who had been five days at the springs for a suppression of the menses, having eaten, in the afternoon a certain quantity of strawberries, immediately experienced nausea, borborygms, and distress; this state continued during the night; she was then seized with a sudden Cholera, so violent and accompanied by such prostration of strength, that she had in the space of eight hours more than thirty intestinal evacuations, and twenty vomitings of greenish matter. The treatment was complicated. We shall allude to it hereafter. The patient drank a quantity of cold water unknown to Hoffman; she recovered, and gained her strength in twenty-four hours.

Hoffman does not establish any difference between Cholera and poisoning with vomiting and dejections. The invasion of Cholera, says he, is ordinarily sudden, although it is most frequently preceded by acid eructations, acute pain in the stomach and intestines, and anxiety about the heart. However, soon after its invasion, vomiting and alvine dejections commence. A portion of the aliments is at first ejected, then bilious matter mixed more or less with mucosities, sometimes yellow, at other times green or black, generally very acid, accompanied by eructations and flatulence, sometimes by blood, in consequence of the excessive frequency of the efforts. Besides the acute pains, there is a sentiment of torsion and erosion, together with swelling of the abdomen accompanied by borborygms, which we distinguish principally above the umbilicus; distressing cardialgia. In proportion as the disease advances, there is excessive thirst, coldness of the extremities, palpitation of the heart, hiccough, suppression of urine, and the body is covered with a cold sweat; frequently we remark syncopy, swooning, and convulsive chills. The disease continues ordinarily for three or four days, rarely for seven, unless it should change its character.

Hoffman is of opinion that we cannot assign any particular seat to Cholera but the stomach and intestines, and especially the duodenum, the irritation of which, *vellicatio*, propagates itself to the biliary ducts, heart, diaphragm, bladder, brain, and spinal marrow.

Besides poisons, Hoffman mentions as causes of Cholera, acrid purgatives and emetics, the abuse of sweet and fermentable aliments, and anger. He adds that this affection is most generally fatal. In no other disease, says he, if perhaps we except the plague and pestilential fevers, is death so prompt as in Cholera, principally among old men, children, and persons exhausted by a protracted malady.

At Montpellier, Sauvages observed spontaneous Cholera every year. The autumnal Cholera, says he, appears three or four times annually in the general hospital; this species occurs suddenly, without any evident occasional cause, spontaneously, in the month of September, in those individuals even who do not eat fruits. Among the symptoms he indicates, are cramps in the calves of the legs and on the posterior part of the other limbs.*

This fact of Cholera returning every autumn in the south of France, deserves to be noted,—it has been entirely overlooked.

Quarin has observed the Cholera at Vienna, in Austria, not only in August, but also in other months, and particularly when warm days were succeeded by cold nights. A few hours after its invasion, he has found persons extremely robust, almost without life, with a very feeble pulse and a dimness of vision. He likewise states, that he treated more than a hundred patients affected with Cholera who, after a short vomiting, experienced hiccough, great debility, dimness of sight, and such a prostration of the pulse, that it could scarcely be distinguished.†

M. J. S. Sengensse reports the two following cases of Cholera, of which he was an eye-witness:—

A young man, aged 19, born in the United States, bilious, and of a delicate constitution, had a tertian ague in the first days of June, 1784, at Adrianople in Romania, and was cured after having taken emetics, purgatives, and quinine. On the 25th of July, being at Buyukdéré, near Constantinople, the weather being intensely hot, after a dinner, at which he had eaten a quantity of melon and drank some wine from the Archipelago, he experienced general lassitude, cephalalgia, a desire to vomit, and slight spasms; colic, vomiting of food, copious alvine dejections, thirst ardent, pulse full and frequent. Warm water for drink and in lavement:

* *Nosologie Methodique.* † *Animad. in morb.*

Excruciating griping, violent spasms, cramps, abundant evacuations upwards and downwards, and suffusion of the face and eyes. The patient was placed in a boat at nine o'clock in the evening. Vegetable lemonade. Griping, vomitings of yellow and green bile, and dejections continued until four o'clock in the morning; then frequent swoonings, aphonia, and extreme debility. At six o'clock, his pulse was almost insensible, countenance pale, eyes hollow; wine of Tokay. At eight o'clock, the pulse rose, and the strength returned; wine of Tokay, light panada. The next morning the patient was well enough to continue his voyage.

In the month of August, 1788, a physician, aged 40 years, fat, sanguineous, hemorrhoidal, of a lymphatico-bilious temperament, in the habit of drinking a quantity of beer, and for the last two months, an abundant solution of vegetable soap every morning, was attacked, during the night, with violent pains in the stomach and intestines, and spasmodic movements of the inferior extremities; about four o'clock in the morning, evacuations upwards and downwards of a yellowish matter; oil of sweet almonds was given abundantly in drink and lavement. At eight o'clock the symptoms increased; almost continual vomiting, as also alvine discharges; these last had the appearance of a strong decoction of the chowder of veal; they were mixed with portions of thick mucous, and exhaled an extremely fetid odor; violent spasms, and such severe cramps that the heels nearly touched the tendons of Achilles; pulse full and frequent, visage and eyes red, acute pain in the head, laborious respiration, ardent thirst. Aromatic gum water, alternately with the flowers of orange, and vinous water. At twelve o'clock, the symptoms continued, suppression of urine, dry skin. At four o'clock in the afternoon, delirium; at six, vertigo, convulsive action, cessation of vomiting, hiccough, intermittent pulse, aphonia; pills of camphor, opium, and saffron. At ten o'clock, cessation of the convulsions, moisture. At midnight, respiration freer; pulse feeble, but regular; sleep and perspiration until five in the morning; wine of Rota. At six o'clock, decoction of rice, and wine. Prompt re-establishment.*

J. P. Frank established a notable difference, in his opinion, between cholera determined by an excess at table or aliments of a poor quality, and cholera which prevails at the end of summer, at the approach of autumn, and at the time in which dysentery begins to appear. Speaking of this last, he makes this important remark—it is observed in every season when cool nights succeed hot days; in temperate climates, it is sporadic and rather un-

* *On the Cholera Morbus.* Paris, ann. XII.

common; sometimes it is epidemic; in warm countries, it is considered an endemic affection. These two choleras, according to him, are distinguished in this way—the first occurs at every season in men given to the pleasures of the table; it depends on an error in regimen, attacks an individual in health, is announced at first by an affection of the stomach, then of the intestines; in addition, the vomiting precedes the dejections, and these frequently diminish. The second, on the contrary, attacks, at certain periods of the year, the temperate man, as well as the one accustomed to excess in eating and drinking. After the expulsion of the aliments from the stomach, and excrements from the intestines, the patient ejects a large quantity of very acrid liquid.

This author regards the secretion of bile as the effect and not the cause of the disease. On this occasion, he remarks that the penalty formerly inflicted on prostitutes in Germany determined in them a species of cholera. They were placed erect in a narrow cage, to which was imparted a circular motion; after a few seconds, the woman discharged simultaneously bile by vomiting and stool. He saw a baker, aged 27, enjoying good health, suddenly attacked with cholera, in consequence of sleeping on the damp floor of a cellar, after having perspired abundantly near his oven. He observes that it has been known to manifest itself in females at each suppression of the menses or lochiæ, and cease on their return.

Every irritation of the stomach and intestines, says he, determines it under certain circumstances, happily not very frequent; and, by a sad inconsistency, unfortunately too common, he classes among the cases of *false* cholera those in which the cause is evident, accidental, and personal.

Pinel considered Cholera Morbus as not differing from an *embarras* of the stomach and intestines, except as regards the symptoms. He assigned as precursory symptoms, bitter taste in the mouth, eructation, salivation, nausea, loathing of food, ardent thirst, a sensation of weight, tension, and burning heat *in epigastrio*, anxiety, griping pains, wakefulness; and as symptoms, repeated vomiting, at first of aliments half digested and green matter, afterwards a greenish, brown, and sometimes black substance; at the same time frequent alvine evacuations, similar to the vomiting; a sensation of acute, tearing and burning pain, in the stomach and intestines; great thirst, disgust for food, flatulence, swelling or contraction of the abdomen. This condition, he continues, is with or without febrile action; it is frequently accompanied by spasmodic contractions of the legs, arms, and fingers; and if it be very intense, there will be swooning, palpi-

lation, and syncopy; the pulse becomes small and scarcely sensible; the patient is fatigued by hiccough; there is coldness of the extremities, whilst the internal parts are burning; the perspiration is excessive, often cold, and the prostration of strength extreme. The duration of this disease varies from one hour to four or seven days; the terminations are a prompt return to health, or gangrene of the intestines, and death. In this dangerous variety of *embarras gastrique*, adds Pinel, the progress of the disease and autopsical examinations have proved incontestably that the gastric irritation can be carried so far as to determine a phlegmasia promptly followed by gangrene.

General Desaix mentioned to me, says Professor Desgenettes, that, shortly after his arrival at Said, several of the soldiers, having eaten grains of ricin in large quantities, were seized with violent vomiting, and had abundant evacuations by stool. This observation, and the first advice to avoid this serious indisposition, was due to this General, devoted to every kind of knowledge.* We are informed by Professor Desgenettes that the treatment was antiphlogistic, and that copious drinks and very fresh oil were especially employed.

Mr. Fodéré frequently observed Cholera Morbus at the end of summer and autumn, at Nice and in the neighboring villages, during the year 1802.†

In 1810, M. Kuttinger, surgeon in chief of the French army in the Kingdom of Naples, noticed several cases of Cholera Morbus in the Calabras, opposite Sicily, during the three warmest months of the year.‡

The Cholera has been remarked at Paris, both in the city and hospitals, for more than fifty years, by the two Geoffries. The son has published the result of the observations made by his father and himself, in the *Dictionnaire des Sciences Medicales*, in the following terms:—

The precursory signs of Cholera Morbus are—cephalalgia, bitterness in the mouth, nausea, excessive thirst, eructations, hiccough, heat *in epigastrio*, borborygms, chill, acceleration of the pulse, lassitude, and thick urine.

The disease often approaches gradually; sometimes it is sudden in its attack; then acid eructations, acute pain *in epigastrio* and intestines; soon, almost constant vomiting, at first of badly digested food, afterwards of greenish, sometimes greyish matter,

* *Histoire Medicale de l'Armèe d'Orient*, 2d ed. p. 24.

† *Voyage aux Alpes Maritimes*, Vii. p. 282.

‡ Larrey, Memoire sur le Choléra Morbus, Paris, 1831. This author was himself attacked by Cholera Morbus, in Italy, in a very severe manner.

and then black, or similar to the lees of wine; evacuations by stool of matter of the same nature, griping, tension of the belly, pains in the intestines, sometimes excruciating, debility, syncopy, total prostration of strength; pulse small, accelerated, sometimes imperceptible; burning internal heat, coldness of the extremities, suppression of transpiration, or cold sweat; urine thick, small in quantity, sometimes not excreted; continual hiccough, delirium, vertigo, contractions of the limbs, and alteration of the features.

The favorable symptoms are—the slight odor, scarcity or cessation either of the vomiting or alvine discharges, tranquil sleep after an amelioration of the principal symptoms; diminution of pain and thirst, regularity of the pulse, although accelerated.

The duration of this affection is often a few hours only; it rarely exceeds the seventh day; terminates either by a prompt return to health, or by intestinal gangrene and death. Infancy and old age yield most quickly to it.

If we take a general survey of the facts which have just been reported, we cannot but be convinced that, since the time of Hippocrates to the present day, the Cholera Morbus has prevailed, at different periods, in Greece, in the Roman Empire, Indies, Modern Europe, England, Germany, Constantinople, Egypt, Italy, France, with nearly the same symptoms, sometimes more, sometimes less intense, assuming ordinarily a sporadic character, at times, however, epidemic.

At first, vomiting of aliments in their original state, or half-digested; alvine dejections of fœcal matter, usually fetid, and sometimes the remains of the food; afterwards, vomiting and alvine discharges of yellow, greenish bile, of an aqueous liquid, whitish, or similar to the washings of meat, sometimes bloody, rarely brown, and at times resembling lees. Sensation of tension, weight, bearing down pain along the œsophagus, in the abdomen, epigastrium, at the base of the chest, in the region of the heart, in the iliac regions, and even in the limbs; internal heat, excessive thirst, invincible loathing of food; tumefaction or contraction of the abdomen, borborygms, flatulence; weakness of the voice; short, frequent, laborious respiration; imminent suffocation, and hiccough. Coldness of the skin, particularly at the extremities; general warm perspiration, afterwards cold, and sometimes fetid. Pulse small, and frequent, irregular, scarcely sensible, rarely full and frequent. Face emaciated, livid, seldom animated; redness of the conjunctiva, dimness of vision; cramps, contractions of the legs and thighs, stiffness of the articulations. At first, extreme agitation, then excessive feebleness, swooning,

syncopy, wakefulness; at the end, vain efforts to vomit, violent tenesmus, sometimes vertigo and delirium. Most generally the duration of the disease is short—prompt recovery or rapid death. Such are the symptoms presented in the observations of which we have just read a summary, and such as will be remarked in the cases we are now about to mention.

The endemic and epidemic character of Cholera Morbus was no longer mentioned, except as a matter of memory, when the report spread through Europe, that this disease caused frightful ravages in India since 1817.

From time immemorial, the Cholera was known in these countries. It is described under the name of *Sinanga*, in a Sanscrit book, in which the following symptoms are assigned it:—chill, cold, as that of the moon, extending over the entire body, cough and difficult respiration, hiccough, pains, *vomiting, thirst, debility, intestinal flux, trembling in the limbs*, incurable. We are informed that this disease was annual in the territory of Madras, and that it re-appeared periodically during the wet season among the poorer classes of people. Its effects are expressed by this proverb, employed on the Coromandel coast: *to vomit and die.**

We have seen that Bontius observed the Cholera, in 1629, at Batavia; that the Steward of the Hospital in that city was suddenly affected by it, and that he perished with frightful rapidity.†

If we believe Lebègue of Presle, the Cholera prevailed epidemically at Bengal, in 1762. Its most fatal symptoms, says he, were continual vomitings of a thick, white, and transparent phlegm, accompanied by very frequent stools.

The English physicians tell us that the Cholera was unusually fatal at Trinquemalay, afterwards at Madras, in 1774, the period at which it was observed in that city by Dr. Paisley. Sonnerat, Noël, and Rochart assure us that it re-appeared on the Coromandel coast, with more than ordinary severity, from 1774 to 1781. In 1782, it was observed in India, according to Dr. Girdlestone. Dr. Thompson witnessed the uncommon intensity and frequency of this disease at Trinquemalay in 1782, and, in 1787, at Arcot and Vellore.

But it is particularly since 1817 that this scourge of India has fixed the attention of physicians, as well on account of the greater fatality and spreading of the disease, as on account of the impulse given at this period to the spirit of observation by the useful works of distinguished men.

* Gazette de Madras, in the Report of M. Moreau, of Jonnès, p. 40. † P. 23.

Among the physicians of English India, who have done most to advance our knowledge in relation to Cholera Morbus, M. J. Annesley is, without doubt, among the first.*

He describes the disease in the following manner:

The subject experiences for some hours a sensation of oppression and anxiety, and a degree of heat *in epigastrio*. The symptoms increase more and more rapidly: the countenance which, at first, only expressed a discomfiture, soon gives evidences of anxiety and suffering. The pulse is generally small, and always concentrated. Such are the phenomena of the first period, or that of invasion.

Occasionally at the same time that these symptoms become manifest, and always after them, the patient complains of sickness of stomach, and a painful sensation, which appears to extend through the whole digestive tube. To these derangements soon succeed copious and frequent evacuation by vomiting and purging, a sensation of vacuity, prostration, inanition, and irregular spasmodic contractions, painful cramps in the muscles of the superior and inferior extremities. These evacuations are composed, in great part, of the matter contained in the stomach and remainder of the digestive tube before the disease. In consequence of their abundance, and the sensation of depletion which succeeds them, it appears to the patient that the whole contents of the digestive tube have been expelled.

The spasms gradually cease to augment, principally in the extremities; but, although they generally extend, they rarely occupy the muscles of the back, loins, and face. The abdominal muscles are affected near their point of contact with the extremities, then those of the thorax, and the diaphragm. These spasms are rather convulsive than tetanic; but they vary in their character in the same patient, at different periods of the disease; in some cases, at the commencement, the muscles contract convulsively, but rigidly, and gradually assume a clonic state, which seems generally to predominate.

The spasms and evacuations are accompanied by deafness, vertigo, ringing in the ears, coldness of the extremities and surface of the body. The patient ordinarily experiences great oppression and anxiety in the cardiac and epigastric regions; the respiration is difficult, interrupted, laborious, frequent, and irregular. Pains, often violent, analogous to colic, are sometimes felt in the abdomen; and, like those which accompany the spasm of the abdominal muscles and extremities, they are relieved by

* *Treatise on the Epidemic Cholera of India*, London, 1831.

pressure and frictions. In some cases the abdominal pains are aggravated by the return of the spasms and evacuations. In proportion as the disease advances, the skin becomes more and more cold; it is covered with an abundant and cold perspiration, wrinkled, soft, and livid, principally on the extremities. The features are contracted, express anxiety, and the countenance assumes a cadaverous aspect. The eyes sink into the orbits, and are surrounded by a blue circle. The pulse is at first small, frequent, and concentrated, then scarcely sensible at the wrist. The blood, drawn at this period, is quite black, thick and oily, and frequently it will not flow from the vein. The arterial presents the peculiar characters of venous blood. During all this time, the patient complains of a sensation of heat towards the epigastrium and umbilicus, and of unquenchable thirst; the tongue and mouth, however, are moist, cold, and white; the lips are cold and blue. The vomiting and alvine evacuations are then frequent, and composed entirely of a liquid similar to rice water, in which portions of mucous and albuminous matter are observed to float. This matter is sometimes turbid, thick, and of various colors, but it is always* free from any mixture of bile. The matter evacuated per anum is expelled with force, as if through a syringe, but usually without any pain.

At a more advanced period of the disease, the evacuations become less and less frequent, and sometimes they are suspended altogether, a long time before death. The same thing is observed as regards the spasms. The urine and saliva do not appear to be secreted, and all the glandular secretions seem to be completely arrested during the remainder of the disease. However towards the end, when the violence of the vomiting and dejections has ceased, an aqueous and limpid liquid, sometimes ichorous, continues to flow from the mouth and anus, until the death of the patient.

As the disorder increases, the eyes sink, the features become altered, and the corneæ are turbid; the extremities are icy, covered with a cold and viscid perspiration, and the whole skin is soft and wrinkled; the hands and fingers look as if they had been plunged for some time into warm water; the nails are blue, and sometimes bluish rays are observed on the skin; the voice is enfeebled, and becomes sepulchral and unnatural; the respiration, more and more oppressed, is generally frequent, sometimes slow, and the air

* In the part of the work of Dr. Annesley, from which we extract this paragraph, the affirmation is absolute; but farther on, it is confined to the second period of the disease, and instead of *always*, the author remarks *almost in no case*.

expired by the patient is cold. During this state, there is usually agitation,—the patient throws himself about continually, and appears to experience great suffering. He bears any disturbance very impatiently, and does not talk but with repugnance; his physical powers being thus under the influence of disease, he nevertheless retains his intellectual faculties until the last hour of his existence.

At the approach of the fatal termination of the disease, the sensation of anxiety and oppression, towards the cardiac and epigastric regions, increases, so likewise does the agitation; the vital forces are gradually worn out, and the patient dies generally, twelve, fifteen, twenty, or thirty-six hours after the invasion.

Before proceeding further, we request the reader to compare this table, made with so much care, with that which we have formed by collecting the symptoms mentioned by Hippocrates, Celsus, Areteus, Cœlius Arelianus, Alexander of Tralles, Bontius, Sydenham, Hoffman, Sauvages, Quarin, Sengenfra, Pinel, and the two Geoffries. By this comparison, it will not be difficult to be convinced of the identity of the Indian Cholera with that described by these authors, in such different periods and countries.

M. Annesley has not limited himself to the enumeration of the symptoms of the disease, which he has observed in India, according to the order in which they appear. Convinced of the necessity of anticipating a malady, which calls for the most prompt treatment, he has mentioned in detail the phenomena of the first period.

Under ordinary circumstances, the features have already undergone a slight alteration, approaching to a state of anxiety, which the patient seems yet to bear well; but the attentive observer recognizes in him a certain prostration, sometimes a viscid perspiration on the skin, and the pulse, although at times full and strong, is evidently embarrassed. This is the proper moment for the abstraction of blood.

At the commencement of the invasion, the patient experiences nausea, he goes more frequently than usual to the *garde-robe;* the matter discharged by stool is nothing more than that contained in the large intestines, and its aspect depends upon the state of the digestive organs. The patient often complains of a sensation of compression in the abdomen; he feels exhausted, and appears to be incapable of the slightest action; pains are frequently felt in the abdomen, but they commonly cease, or are alleviated by pressure or by easy evacuations; and the urine is generally voided in small quantities and at long intervals. In

certain cases, the abdomen is larger than usual, when even the patient feels a sensation of vacuity in this cavity after repeated evacuations.

If we read in the work of M. Annesley, that the bile never appears, or at least very rarely, in the matter ejected from the stomach, we find in Areteus and Cœlius Aurelianus mention made of the whitish and aqueous liquid of which the skilful physician of Madras speaks. We shall again allude to this absence of bile, which has been considered as meriting great importance. The reader should not forget the opinion of J. P. Frank respecting the presence of this liquid in the expelled matter characterising Cholera.

M. Gravier observed the Cholera, in 1817, at Pondichery. Sometimes its invasion was preceded by a remarkable disturbance in the economy, sometimes it occurred suddenly, and always during the night. After a diminution in the temperature of the skin, sensible at first in the extremities, slight spasms were felt in the limbs, then dejections and vomiting of an aqueous matter, mixed with whitish mucosities, and sometimes worms were ejected from the stomach. The evacuations soon became violent; the cramps extended to the muscles of the abdomen and chest; the eyes became hollow, fixed and depressed in the orbits; thirst ardent, tongue red on its whole surface; excruciating pains and burning heat in the stomach and intestines; pulse remarkably small, and becoming more and more so; extreme agitation, convulsive movements, groans, cries; prostration, loss of speech, delirium, drowsiness, coldness of the extremities, pulse thready; in fine, death ordinarily in the space of one to three hours.*

During the summer of 1818, M. Deville witnessed an epidemic Cholera at Bengal. The disease seldom manifested itself in a gradual manner, generally, those who were affected with it, were struck as if by a thunderbolt; the pains in the epigastrium and intestines were extremely violent; the vomiting very frequent and severe; the matter discharged by the patient was sometimes green, but most generally black; the stools were nearly equal in number to the vomitings; they were of a similar nature as to color, to what was discharged from the stomach; but, towards the middle of the disease, the stools were composed of a blackish liquid with some whitish floculi, which were sometimes found to be mixed with them. The head was always painful,

* Thesis sustained at Strasbourg in 1825; *in the exposition of the new doctrine*, by Goupil, p. 362.

principally in the supra-orbital region, and the patient often found it impossible to keep his eyes open; according to the description given by the patient, the pains were excruciating, and it appeared as if his intestines were subjected to some violent traction; the intervals of calm were very rare; the pains commenced with the first vomiting, and did not cease until death or the disappearance of all the symptoms; the belly was ordinarily hard, and so tender that the slightest contact increased the distress: the urine was in small quantity; there was desire to pass water without the ability to do so; the pulse was small, intermittent, and scarcely sensible. The thirst was excessive, a burning heat extended through the whole interior of the system; the body was often covered with a cold sweat; the limbs were stiff and cold. In the midst of the vomiting, the patient fainted, and his strength entirely failed. The delirium sometimes commenced with the first symptoms; often it was preceded by vertigo, and very frequent numbing sensations.*

M. Hachard witnessed the Cholera Morbus at Calcutta in 1818, and assigns the following symptoms to it.

The invasion was ordinarily sudden, very acute pain in the epigastrium, then continual stools and vomiting; the matter evacuated was yellow, greenish, and black; the belly was hard and tender; the patients rolled on the ground on account of their great distress; the extremities contracted; the trunk was bent forward, and this curvature continued after death; after these spasms, the patient was profoundly prostrated; the pulse was weak, frequent, and convulsive; tongue red and dry, and thirst excessive; the extremities cold; the whole body was chilled, covered with a cold and viscid perspiration, and sometimes with reddish spots.

In 1819, the Cholera Morbus having appeared in the Isle of France, M. Quesnel recognised three distinct degrees of it.

The first degree, the most intense, attacked particularly young and robust subjects; invasion sudden; insupportable cramps in the extremities, especially in the inferior; cardialgia and excruciating colic; retraction of the belly; vomiting and dejections, at first, of substances contained in the stomach and intestines, afterwards, of a whitish mucous matter, not very abundant, possessing a sickly odor, and free from bilious mixture; thirst ardent, and the stomach so irritable, that nothing could be retained in it; urine scanty; pulse small, corded, scarcely perceptible; icy coldness; cold and viscid perspiration; extremity of the fingers withered, and, as it were, macerated; nails livid; inability to rest, save on the back, ex-

* *On the Cholera Morbus of Bengal.* Paris, 1828.

treme prostration; countenance cadaverous, piercing groans; voice feeble and hoarse; integrity of the mental faculties, but perfect indifference of the patient, even as regarded their position; hiccough, frequent syncopy; in fine, death often in ten or twelve hours, and frequently much sooner, without agitation or agony; or, (this however was infinitely rare, no matter what remedies were employed,) —a sudden change in the evacuations, which assumed a bilious character, a simultaneous diminution of the symptoms, and soon afterwards a cessation of the morbid phenomena.

The second degree is less violent. The evacuations, instead of remaining white, soon presented a bilious character; the progress of the disease was less prompt, and the chance of recovery greater. However the individuals affected with this degree of the disease were debilitated or aged subjects; and the disease, after some days' duration, often took on the character of adynamic fever, and then terminated constantly in death.

The third degree generally attacked subjects of a dry and nervous temperament; it was distinguished by its symptoms—pulling sensation in the limbs; coldness of the skin; gloomy countenance, alteration of the features; more or less acute colic; sometimes white sometimes bilious alvine evacuations, but no vomiting; and small and corded pulse. The disease lasted from three to eight days, and usually terminated favorably.*

M. Lamare-Picquot describes very briefly the Cholera of the Isle of France—violent colic; evacuations upwards and downwards, repeated at short intervals; disappearance of the pulse; total annihilation of the physical forces; sometimes a species of viscid transpiration, not very abundant, is remarked; most generally the skin is cold and dry; excessive thirst; the eye soon becomes dull and sinks into the orbit; the cheeks and rest of the face become griped; convulsive movements and numbness manifest themselves; in this state the patient sees but little, sometimes not at all, and notwithstanding this sort of physical death, he is enabled to appreciate fully his condition, even when he is unable to express himself.†

M. Keraudren has collected, in a table remarkable for its conciseness, the symptoms of Cholera observed by the surgeons of the French marine in India, the Isle of Bourbon, and aboard the government vessels.

Invasion sudden, often after a repast and during the night; cephalalgia and gastralgia; vomiting, at first, of alimentary

* *Sur l'épidémie du Choléra-Morbus qui a désolé l'Ile-de-France.* Paris, 1823.

† *Observations sur le Choléra Morbus.* Paris, 1831, p. 10.

matter, then bilious, and finally, serous and mucous; evacuations repeated and involuntary, of a greyish white color, rarely yellow or black; tension of the epigastric region, depression of the abdomen; thirst ardent; perspiration viscid; pulse small, corded, concentrated; anxiety, cramps, supination, convulsions, trismus; tetanic rigidity, alteration of the countenance; coldness of the extremities; hiccough, syncopy, insensibility of the pulse and movement of the heart; voice feeble and hoarse; respiration slow, and finally death.*

The Cholera Morbus was observed, in 1822, at Schiraz, by Sir John Cormick, with the following symptoms:

Vomiting and dejections of a great quantity of whitish liquid; coldness of the whole surface of the body, especially of the hands and feet, which presented a livid aspect; pulse entirely insensible; violent spasms of the muscles of the legs, thighs, and abdomen; thirst great; eyes sunk; aspect cadaverous; agitation extreme; anxiety, oppression in the precordial region; the palms of the hands and soles of the feet wrinkled as if they had been plunged for some time into warm water; a cessation of the secretion of urine, bile, and saliva; the heart resisted with difficulty the oppression it sustained; the eyes were suffused. The disease was sometimes so violent that the patient expired during vain efforts to vomit.†

Dr. David Makertienne having observed the Cholera, in 1822, at Tèflis, in Persia, states that this disease is announced by pains in the epigastric and umbilical regions; vomiting and alvine discharges commence almost immediately, and continue until death. The dejections are at first composed of alimentary matter, and then an albuminous fluid appears, more or less viscid, and very abundant. The secondary symptoms are diminution in the pulse, which is scarcely sensible; injection of the eyes, coldness of the extremities, elevation in the temperature of the abdomen, prostration of strength, and death ensues in a few hours. There is a variety of this disease, which commences with cramps and pulling sensations in the limbs; pains are felt in the hands, particularly at the fingers, in the feet and especially in the fleshy portion of the legs. Vomiting and diarrhœa unite with these symptoms at the end of a few hours, or after a day or two; they are less obstinate than in the first variety, and consequently give some hope of recovery. But in all cases, we find the same abundance of aqueous fluid constituting the dejections, the same falling of the pulse, coldness of the ex-

* *Mémoire sur le Cholera Morbus de l'Inde, dans le Journal Universel et hebdomadaire:* Janvier, 1831. t. 2. p. 18.

† *Bisset Hawkins, History of the Epidemic Spasmodic Cholera*, London, 1831.

tremities and elevation in the temperature of the epigastric region, cold and icy perspiration on the limbs, and extinction of the voice.*

In the ports of Syria, on board the corvette *Active*, M. Angelin observed the Cholera manifest itself suddenly, without any precursory signs, by acute, tearing, and excruciating pains in the epigastric region, and followed almost immediately by vomiting and dejections. Sudden prostration of strength, decomposition of the features, cold perspiration, and insensibility of the pulse.

The Cholera observed at Arkatak, on the frontier of Persia, in 1830, by Doctor Hubenthal, is described by him in these terms:

The disease ordinarily showed itself suddenly, without any premonitory symptoms, by vertigo, nausea, vomiting, and a diarrhœa of extreme violence. The matter evacuated was mingled at first with the remains of the food; it was composed of mucosities, which were very rarely tinctured with blood; it soon presented the aspect of water slightly mixed with milk, and sometimes it had a peculiar acid odor. The quantity of it exceeded that of the drink. The evacuation even continued when the patient abstained from drinking. In the great majority of cases, this water was evacuated suddenly, unattended by nausea or any efforts. Ardent thirst, urgent desire for cold water or ice; pain along the dorsal spine, with a peculiar sensation of cold; pain in the chest, epigastrium, and bas-ventre, not increased on pressure; pulsations of the heart extremely feeble; icy coldness of the skin; spasms of the limbs; alteration of the voice; swooning, convulsions, and agitation. The patient lay at one moment on the left side, then on the right, most frequently on the abdomen; eyes red, dull, partially covered by the lids, and sunk into the orbits; face pale, changed, and resembling clay; the lips, the extremities of the nose, lobes of the ears, extremities of the fingers and toes blue, as also the nails of the hands and feet; the blood, thick and dark colored, flowed by drops from the vein; its temperature was below what was usual; the respiration slow and interrupted by profound sighs; tongue cold, most generally humid, but not coated; the pulse which, at first, was weak, small, depressed, soon disappeared under the pressure of the finger, as likewise the pulsations of the heart; and all the senses appeared as if annihilated. The patient now became indifferent, insensible, and wished for nothing; he replied, however, to questions addressed to him, but forgot immediately what he had just said. Those who had been dangerously affected, and had recovered, retained no recollection

* *Moreau de Jonnès, op. cit. page 14. et Sequentia.*

of what passed during their illness. When the disease became aggravated, the coldness of the skin increased, and the skin on the palms of the hands and heels wrinkled, sometimes the extremities were covered by a cold perspiration; the subject was then insensible to every galvanic and electric action; in fine, death terminated this series of symptoms. When the progress of the disease was slow, he observed wakefulness, cardialgia, salivation, hiccough, phenomena which were not pathognomonic. The duration of the disease is not the same in all persons, particularly when it appears for the first time in a country, for then it proves fatal sometimes at the end of a few hours. M. de Hubenthal adds that the inhabitants of Arkatak give the name of *Black Cholera* to that in which the whole body becomes suddenly glacial, unaccompanied by vomiting and diarrhea, the nails turn blue, and the skin on the feet and hands become wrinkled; whilst, on the contrary, they call that *white cholera*, which commences with vomiting and diarrhea, and which gives greater hopes of recovery.*

In 1829-30, M. Rang observed the Cholera at Orenburg. It announced itself several days in advance by vertigo, dizziness, anxiety, wakefulness, pale visage, a sensation of cold in the chest, palpitations, acceleration of the pulse, pains in the abdomen, nausea, loss of appetite, and constipation; then it commenced suddenly by an aqueous, white diarrhœa, followed by successive vomiting of liquids differently colored, accompanied with tension and excruciating pains. The countenance of the young soon assumed the aspect of decrepitude; and the lips and extremities were covered with blue spots, which afterwards extended over the whole body.

Sir William Crichton describes, in the following terms, the symptoms of Cholera observed at Moscow:—general agitation, violent pain of the head, vertigo, profound languor, oppressed respiration, suffocation, pain in the epigastrium and sides; pulse lively and frequent; vomiting at first of undigested food, then of an aqueous liquid mixed with mucosities of a peculiar odor; frequent dejections; acute pains; scarcity or suppression of urine; excessive thirst; cramps in the legs, commencing at the toes and extending gradually over the whole body; voice feeble and hoarse; eyes dull and hollow; features altered and cadaverous; coldness, contractions, and lividity of the extremities; general chilling; lips and tongue blue; perspiration cold and viscid. The vomiting and dejections soon exhaust the patient, the spasms increase, the pulse becomes insensible; the pulsations of the heart are slow; and the patient, after terrible sufferings, dies immedi-

* *Description et Traitment du Cholera Orientale, dans le Journal de Médecine et de Chirurgie Pratiques*, Juillet, 1831.

ately after a short moment of calm. The duration of the disease is from twenty-four to twenty-eight hours, and sometimes shorter.*

At Moscow, Dr. Keir has observed that the Cholera most commonly commenced by a feeling of general indisposition, soon followed by an extraordinary sensation of weight or oppression in *epigastrio*; suffocation, and sometimes tingling in the ears. Soon, a feeling of general debility, alvine evacuations, nausea, and vomiting. The matter contained in the stomach and intestines was expelled first; then, the gastro-intestinal mucus, slightly colored by a greenish bile; in fine, an aqueous liquid, sometimes resembling milk-whey, at other times a decoction of barley or rice, and containing at times a white and flocculent material. These exhaled a strong and peculiar odor. The pulse became miserable, or quite insensible; the surface of the body was chilled, respiration oppressed. Spasmodic contractions of the muscles, particularly of the toes, feet, legs, fore-arms, sometimes of the thighs, rarely of the trunk, and often the patient complained of acute pains in the parts, which were the seat of these spasms; the thirst was ardent; the dejections and vomiting became more and more frequent; the eyes were dim, and surrounded by a blackish circle; the features became altered; the body fell away sensibly; the hands and feet became hard; the skin of these parts wrinkled, as if it had been plunged into hot water: the skin was cold throughout its whole extent, and more particularly at the extremities; a cold sweat covered the face, fore-arms, and chest; anxiety, difficulty of respiration, and agitation then manifested themselves; the tongue was pale, or of a light bluish tint, habitually covered by a thin layer of tenacious mucus; it appeared cold to the touch. The thermometer of Reaumur, held for two minutes on the tongue, was not raised above 20° to 28°. At this period, hiccough sometimes ensued; the respiration became more and more difficult, and the patient died in a few hours, without any signs of re-action. At other times, the patient continued for a long time in this condition, without any pulse, and preserving his intellectual faculties until a few moments before death.

In some patients the disease commenced by a diarrhea, which continued for a few days, and then became complicated with all the symptoms we have just described. In others, the disease was limited to nausea, vomiting, and bilious evacuations. In certain cases, the patients appeared as if attacked by some sud-

* Bisset Hawkins, *History of the Cholera*, page 100.

den blow, or struck by a thunderbolt, from the commencement; a prey to the most dangerous symptoms, they died before any relief could be afforded them.

M. Keir mentions some cases in which, in consequence of a fortunate natural re-action, or of the good effects of the treatment, the disease, instead of proving so rapidly fatal, diminished in intensity; the evacuations became less frequent, the pulse re-appeared, the heat gradually returned; the spasms were less violent, and in fine, ceased altogether; the patient could sleep and take nourishment. Here a febrile action ensued; if it was moderate, the patient ordinarily recovered; the secretions re-appeared; a gentle perspiration manifested itself; the urine flowed frequently, colored with bile; then commenced bilious stools, which from time to time were mixed with black blood for several days in sucession; at other times the mixture consisted of mucus and blood; under some circumstances, thick, yellow, or brown mucosities, or frothy matter. This state did not always terminate favorably. The subject no longer presented the appearance of Cholera; nothing in fact indicated that he had been affected by it. Sometimes we recognised in him an inflammatory condition, or rather sub-inflammatory state of the stomach and intestines, most frequently of these last, sometimes of both together. Sometimes there was an inflammation of the lungs with pain in the side, cough, viscid expectoration and fever. At other times there was a bilious or nervous bilious fever, sometimes with a suppuration of the parotid, or axillary buboe. Again, in fine, there was a congestion and subinflammation of the brain and spinal marrow, and such cases were most usually mortal. In these cases, after the alvine evacuations, vomiting and cramps had ceased, the patient complained of pains between the shoulders, or on some other point of the vertebral column, or even in the whole of its extent: he appeared as if asleep, and the vessels of the conjunctiva were injected. The redness of the conjunctiva began to show itself in the inferior part of the globe of the eye, gradually increased, and terminated by gaining the superior portion at the same time that the eyes were turned upwards, and thus exposed the whole of their inferior part gorged with blood. This state usually terminated by a profound coma and by death in a few days.

The most rapid and violent attacks of the disease terminated sometimes by convulsions; and in some cases, a cutaneous eruption, similar to that of urticaria and rubeola, appeared on the different points of the body, during several days. Such patients as had these symptoms always recovered.

The duration of the disease varied from a few hours to several days. The disease often reached the third period, without having

passed through the second. Convalescence was slow. M. Keir never saw but one person attacked a second time with the disease. Relapses were more common.*

Drs. Russel and Barry have carefully described the symptoms of Cholera, which they witnessed at St. Petersburgh:—an evacuation, at first of feculent matter, slight cramps in the legs, nausea, pain or heat in the epigastrium, and a general lassitude, announce, they say, the signal. Ordinary diarrhea often continues for one or more days, without any other remarkable symptoms, and the patient, all of a sudden, generally early in the morning, presents a livid appearance, and is almost deprived of life. When the symptoms are arrested in their developement by a prompt and judicious treatment, the evil is completely averted. There is no interval when the disease commences by violent vertigo, nausea, nervous agitation, an intermittent, slow or small pulse, and by cramps beginning in the ends of the fingers and toes, and extending rapidly to the trunk. Vomiting or alvine evacuations, or both together, of a liquid similar to rice water, barley water, or milk whey; alteration and contraction of the features; sinking of the eyes; wildness of the countenance and an expression of terror. The lips, face, neck, hands, feet, and soon the thighs, arms, and the whole surface of the body assume a livid, purple, black, or brown aspect, according to the individuals, and variable according to the violence of the attack. The fingers and toes lose a third of their volume; the skin and soft parts wrinkle, become hard, and shrivelled; the nails present a pearl white appearance; the course of the large superficial veins is marked by bands of a deep black color. The pulse is thready, scarcely sensible, or altogether imperceptible. The skin is icy and often humid; the tongue, always moist, frequently white and coated, is flaccid and cold, resembling a piece of dead flesh. The voice is nearly extinct; respiration rapid, irregular, and imperfect; the inspiration appears to be effected by a violent effort of the chest, whilst, if the case be desperate, the alæ of the nose, instead of dilating, contract and prevent the air from entering. The expiration is brisk and convulsive. The patient asks for nothing but water; his voice is weak and dull. He pronounces but one word at a time, turns constantly from one side to the other, and complains of an insupportable weight and a distressing sensation in the region of the heart. He makes efforts to respire, and frequently places his hand on his chest. The teguments of the abdomen often present large irregular folds; whilst the belly itself is rigidly con-

* *Rapport à la suite de celui du conseil de santé d'Angleterre.* Paris, 1831.

tracted and the diaphragm drawn violently upwards and inwards, on the side of the thorax. There are sometimes tetanic spasms in the legs, thighs, and lumbar region; there is neither tetanus nor trismus. The patient at times constantly utters a dull and plaintive murmur; the secretion of urine always completely suspended. The vomiting and alvine evacuations are neither very violent nor abundant. In the face especially, the livid appearance becomes every moment more intense and extensive. The lips and cheeks sometimes swell, and are effaced during expiration; we often see a white froth betwen the lips. The blood, when we are enabled to abstract it, is black and thick; it flows drop by drop, and appears cold to the touch. The respiration becomes very slow; twitchings manifest themselves in the tendons. The intellect remains unimpaired. The patient loses the ability to swallow, and falls into a state of insensibility; there is never any rattling in the throat, and death occurs tranquilly after one or two convulsive fits, more or less long. But few patients recover from this intense degree of Cholera.

In less violent cases, the pulse is not altogether lost, but extremely feeble; the respiration is less embarrassed; the oppression and distress in the chest are not so troublesome, although the vomiting, alvine evacuations and cramps may be more violent.

When death is not the consequence of these dangerous symptoms, in twelve, twenty-four, rarely forty-eight hours, the pulse and heat are gradually re-established; the patient complains of head-ache and a rustling noise in the ears; the tongue is coated, becomes redder near its point and on the borders, and also dryer. The urine, of a deep color, flows with pain and in small quantity, the pupil is often dilated; the region of the liver, stomach, and abdomen in general are painful on pressure; in a word, the patient is then attacked with a continued fever, which sometimes terminates with convalescence, announced by abundant perspiration; it, however, most usually persists so that the quickness of the pulse and heat of the skin continue; the tongue becomes brown and dry; the eyes are injected and heavy; a dull redness covers the face, and is accompanied by stupor; the lips and teeth are coated with a black paste; the patient is sometimes pale, and prostrated; the pulse is below its natural standard, and the temperature of the body diminished. Delirium ensues, and then death from the fourth to the eighth day. Convalescence is prompt and perfect. Relapses are rare, and seldom fatal.

M. M. Brière and Legallois wrote from Varsovie, that the first persons affected with Cholera, coming under their observation, presented in a greater or less degree the following symptoms:—

profound alteration of the countenance; dilatation of the pupils; coldness of the extremities, smallness and even total absence of the pulse; painful cramps in the limbs; vomiting and alvine discharges of serous, whitish matter, sometimes bilious, at other times bloody; livid appearance of the extremities, and sound mind. All those patients, who had previously enjoyed good health, were suddenly attacked with a violent pain in the abdomen, followed by vomiting and almost continual stools. The abdomen and epigastric region were painful on pressure.*

M. Foy wrote from Varsovie that the Cholera declared itself with the following pathognomonic characters:—altered, livid, and clay colored countenance; eyes sunk into the orbits, dull, and, as it were, frightened; cheek bones prominent, cheeks depressed; nose thin and cold; lips cold and open; tongue white and humid; thirst ardent; acute pains in the stomach and in the whole extent of the digestive tube, accompanied by convulsive movements; nausea, followed by hiccough; vomiting. The vomiting and dejections alternated or occurred simultaneously, and when these phenomena ceased suddenly, death was near at hand. Belly ordinarily depressed and always painful, sometimes, however, it was distended; urine scanty; region of the liver painful, often tumefied and hard to the touch; the spleen was swollen at times, and very sensible, but the liver is nearly in its natural condition; complete intelligence, a few moments even before death; general prostration, voice extremely feeble and soft; respiration easy, sometimes hurried; pulse insensible; movements of the heart hurried or convulsive; functions of the skin completely destroyed; the inferior extremities approached the trunk, and were affected, particularly in the calves of the legs, with cramps extremely painful and often repeated; these cramps were likewise remarked in the fore-arms; coldness and ecchymosis of the extremities, as also of a great part of the surface of the body; nails livid.†

M. Scipion Pinel, likewise wrote from Varsovie that, in the prevailing disease, the skin was livid, dry and cold; the extremities of the body were icy and black; the countenance, ordinarily livid, expressed terror; the eyes, thrown convulsively backwards, were sunk into the orbit as after a protracted marasmus; the abdominal parietes, strongly contracted, seemed to adhere to the vertebral column, and the patients were bent double, so that their knees nearly touched the chin. The pulse was imperceptible, even in the carotid arteries; but by auscultation, he was enabled to hear in the heart, towards the aortic cavities, a feeble movement. The

* 19 *Avril.* † *Séance de l'Institut du* 30 *Juin*, 1830.

respiration was short and hurried, accompanied by groans and hiccough; vomiting was rare; dejections more frequent, yellow, brown, or whitish; often there were neither dejections nor vomiting. In the midst of this general disturbance of organic life, the intellect appeared to be unimpaired; there was no delirium nor dreaming; and by insisting, he obtained a rational answer from the patient. In this disease, the most dangerous symptoms were general cold and lividness, and particularly threatened suffocation, and a cessation of the pulsations in the heart. This state continued some hours, sometimes a day, rarely longer. A remission of a few hours may occur, then a relapse; and it was generally on the second or third day that the patients died. When the disease was extremely violent, death ensued in a few hours. Convalescence was long, painful, always complicated with some profound organic affections, among which anasarca and gangrene of the extremities were the most frequent. The countenance preserved for several months after the disease, the cadaverous appearance, and its pulsations of the heart were remarkably slow, scarcely more than 30 or 40 in a minute.*

M. Gœury, sent to Varsovie by the Polonese Committee, stated the following as the symptoms of Cholera:—face livid, blue, and cold; eyes sunk into the orbits, expressing fright; extremity of the nose cold; mouth open; lips covered with a fuliginous paste; teeth yellow and dry; tongue cold and white on its surface, rarely red and dry; frequent hiccough; vomiting of white sero-albuminous matter, rarely bilious; alvine dejections often repeated, and small in quantity. The matter, white or yellow, exhaled an acid odor. Hiccough, vomiting, and dejections sometimes absent. The patient experienced in all his limbs painful cramps, which were felt more especially in the fore-arms and calves of the legs, and caused him to utter the most piercing cries. During the cramps, the contraction of the muscles was manifest; this symptom never failed. The head was painful, the patient complained of pain in the whole extent of the digestive tube; the perspiration covering the body was cold, viscid, and exhaled a fetid odor. This perspiration occurred frequently in subjects who were near dying in consequence of violent pains. The hands, feet, shoulders, nose, tongue, and chin were cold; the hands and feet were ecchymosed; the integuments of the whole body were bluish; the nails became livid and dull. The intellect remained entire and perfect until the last moment. The prostration was such that the patient was often thrown into a state of apparent death. He could not remain on his legs,

* *Séance de l'Institut*, du 18 Juillet.

and lie down voluntarily on his abdomen. Respiration was slow, the circulation nearly arrested in the extremities, pulse scarcely sensible in the brachial artery, and convulsive movements of the heart.*

M. Londe, President of the French Medical Committee sent to Poland, has politely furnished me with the following details respecting the symptoms of Cholera, which he observed in the course of his honorable mission. When the attack was not sudden, it was preceded by a feeling of distress in the epigastric and abdominal regions, by nausea, cramps, and a looseness, which continued from six to eight days, accompanied by excessive weakness, contusive pains in the extremities, and a distressing sensation around the umbilicus. The skin soon became livid; if it was pinched, the folds which were formed, did not disappear; the nails were blue; the extremities cold and icy; the face was changed, possessing a peculiar aspect; the eyes were profoundly sunk into the orbits, dull, covered by a sort of pellicle, and surrounded by a black circle, sometimes animated, and injected with blood. The globe of the eye was often raised so that only the white portion of it could be perceived; the face was livid, pale, grey, bluish, nearly black; the features were decomposed. Vomiting of matter rather serous than mucous, sero-albuminous, frequently resembling rice water, in which mucous flocculi were observed to float; it sometimes resembled the white of egg mixed with water; dejections, at times whitish, then again brown, of the same nature as the vomiting; sometimes these two symptoms were wanting, or rather they presented themselves only at the commencement or termination of the disease; the tongue was white, moist, and cold, sometimes bluish; lips cold and purple; nose cold; thirst intense and insupportable; epigastrium and abdomen were at times very painful; frequently the abdominal parietes adhered, as it were, to the spinal column. The respiration was extremely oppressed and laborious; the voice was so feeble that it could scarcely be heard; the pulse was small, often imperceptible, even in the carotids; with the stethescope he was enabled to hear but a very feeble movement of the heart. The cramps continued and extorted cries from the patients; the muscles were painful on pressure; in fine, no excretion of urine. These disorders were not accompanied by delirium; the senses were obscured, but the patients often replied intelligibly to the questions addressed to them, although the intellectual faculties were oppressed by the suffering. The expression of the countenance, cramps, cold, absence of the pulse and of the urinary secretion, were constant symptoms. The progress of the Cholera was rapid:—its duration varied from a few hours

* *Mémoire sur le Choléra-Morbus, par le Baron Larrey*, Paris, 1831.

to two or three days; its fatal termination was prompt. M. Londe has repeatedly observed it to prove mortal in four hours, in individuals of both sexes. We may almost consider the patient out of danger, when the heat and pulse re-appear, provided the latter is not thready, but full. Convalescence was long and painful, often accompanied by œdema, anasarca or gangrene of the extremities. When convalescence commenced, the pulse preserved, for several days, a remarkable slowness and *rareté*. In thirty convalescents from 19 to 26 years of age, M. Londe remarked that it did not offer more than from 36 to 50 pulsations in a minute.

As fatiguing as it may have been to the reader to follow the details of this long series of descriptive tables, it was indispensable to present it to his consideration. I cannot be content with asserting that Cholera Morbus is one of those diseases, whose phenomena appear to be the most constant, notwithstanding their variety, in every age and country; this requires to be demonstrated by the facts themselves. Actually, I find myself spared the necessity of any lengthened reasoning on this subject. But one thing yet remains to be done, which is to make a physiological analysis of the phenomena of Cholera Morbus, and to establish the differences of this disease, in reference only to the symptoms. In a subsequent chapter, I will present the reader with the results of auptopsical examinations, and the consequences which flow from them as to the nature and seat of this affection.

We have remarked that each observer has classed the symptoms of which he was a witness, nearly, if not entirely, in the order, in which they manifested themselves to him. We must pursue a different route, when we wish to examine methodically, the value of these phenomena, as regards the diagnosis. It then becomes necessary to arrange them in a scientific order for the purpose of rendering them separately, and in their aggregate character, more intelligible; with this view, we shall now refer them to the organs in which they are found to declare themselves.

Digestive Organs.—Sentiment of distress, weight, tension, pulling, anxiety, burning heat in the epigastrium and umbilicus, extending, in fine, to the whole abdomen.

Pain in this cavity, sometimes increasing, sometimes diminishing by pressure and frictions.

Abundant and repeated vomiting and dejections, at first of alimentary, bilious, fecal and mucous matter; afterwards of an aqueous, serous, limpid, whitish substance, often flocculent, sometimes thick, green, brown, fetid in certain cases, inodorous in others, and acrid in some instances.

Distressing thirst:

Tongue and mouth, moist, cold, and white.

Respiratory Organs.—Difficult, irregular, oppressed respiration, generally prompt, sometimes slow;

Spasms in the muscles of the thorax and in the diaphragm;

Hiccough;

Voice feeble, hoarse, sepulchral.

The air expired is cold.

Circulatory Organs.—Pulse quick, concentrated, then small, rare, thready, insensible;

Blood black, thick, glutinous, flowing with difficulty from the vein and artery, when these vessels are opened;

Urine small in quantity, and voided with difficulty.

Organs of Sense.—Humming in the ears, difficulty of hearing; vertigo, dimness of vision; eyes dull, surrounded by a livid circle, and sunk into the orbits.

Alteration of the features, cadaverous aspect of the countenance; skin cold, covered with a cold and viscid sweat, then of a clay color, and wrinkled, particularly at the extremities.

Organs of Locomotion.—Agitation, contractions, convulsions, tetanic rigidity, and pains in the limbs; profound prostration.

The *Intellect* ordinarily continues unimpaired in the midst of these disorders, until even it becomes destroyed with sensation, respiration, circulation, and motion.

Such are the phenomena observed, not in all cases of Cholera Morbus, as we might be induced to imagine, but only in that which is the most intense, and which determines death.—Among these phenomena are both the symptoms of the disease, and those of dissolution, but more frightful here, as death is always prompt and sometimes even sudden.

Cholera Morbus rarely attains this degree of intensity when it is sporadic; rarely also when the epidemic does not prevail very generally.

Sporadic Cholera, purely accidental, that is, due to individual causes, is ordinarily limited, as all practitioners know, to a sensation of distress in the epigastrium, nausea, vertigo, vomiting, and discharges of aliment imperfectly digested, of bile and mucosities, with painful pullings in the limbs, especially in the inferior, producing a general fatigue and debility more considerable than would appear to be occasioned by a disease, whose duration is at most but a few hours.

Sporadic Cholera occasioned by an individual cause or by the character of the seasons, sometimes determines very dangerous symptoms, namely, acute pains, convulsions, and profound prostration, as we have already noticed in the observations of Zacutus,

Sydenham, Hoffman, Quarin, and Sengensse. However, recovery most frequently ensues.

Cholera presents the greater part or totality of the alarming symptoms, of which we have just had an enumeration, in epidemics affecting a considerable number of individuals at the same time, or successively, and it is then that it proves so rebellious to all the resources of our art.

We may, therefore, divide Cholera into mild, dangerous, and mortal, (*Cholera mitis*, *gravis*, *lethalis*,) provided we do not make of these three morbid varieties, three distinct species of Cholera.

In truth, even in the epidemic which produces such destructive ravages among those submitted to its influence, there are some who experience but a partial degree of its violence, and others who have it very slight. On this occasion, I will cite the observations, which M. B. Zoubkoff collected in reference to himself during the epidemic at Moscow.

Chief-adjunct of a quarter of that city, he visited the patients daily. The season was cold and rainy; the frightful appearance of the patients, their sufferings, and the despair of families could not fail to produce a strong impression upon him. Notwithstanding the external use of the chloride of lime, going home, in the evening of the 4th October, after having visited a merchant attacked with a violent Cholera, still followed by his terrible countenance, his groans and cries, he experienced vertigo, anxiety, pain in the epigastrium, and finally nausea. The vertigo and nausea soon obliged him to retire to his bed ; he applied to the abdomen a linen moistened with Cologne water, and covering himself with a pelisse, he produced an abundant perspiration ; in two hours all the symptoms had disappeared. The next morning, he again visited the merchant, and saw him once in the evening, a few hours before his death. On the following day, on his way home after visiting two other patients, he experienced the same ill effects just mentioned, and again provoked a perspiration, which was followed by a cessation of the symptoms. He then took a purgative and was relieved ; but soon a slight pain was felt in the epigastrium, the nausea and anxiety re-appeared, notwithstanding the continuance of the external use of the chloride of lime ; to these were joined borborygms, and a remarkable alteration of the face and eyes. This state of the disease gradually subsided, without the employment of any other medicines, and on the 17th of Oct., M. Zoubkoff was perfectly re-established. I attribute, says he, these two attacks to the epidemic influence of the Cholera experienced by nearly all the inhabitants of Moscow, and which, in conse-

quence of a derangement in the nervous system, was frequently transformed into the real Cholera.*

The duration of Cholera is generally short, and it does not necessarily depend on the severity of the disease. In a word, although the mild form of Cholera almost always terminates favorably after a few evacuations, yet it may continue a day and even longer; whereas the very intense form of Cholera frequently terminates by death in an hour, and sometimes, even, in a shorter time.

One or several hours, one or several days are the limits of the duration of Cholera Morbus. The longer the duration, the greater will be the chance of recovery.

Whenever it is prolonged, evacuations of mucous, serous, colorless liquid succeed the vomiting and dejections of indigested food, of bilious and fecal matter. The evacuations of this character occur the more readily in epidemic Cholera, because it is more intense and rapid; the violence of the contractions is such that, both by vomit and stool, they expel almost immediately all the contents of the digestive tube; the vomiting and dejections that follow are nothing more than the evacuation of the liquids secreted by the gastro-intestinal mucous membrane. It appears that the duodenal orifice of the ductus choledochus contracts instead of opening, as it does generally in vomiting, which is less violent; at least, the bile ceases to appear in the excreted matter.

The favorable termination of Cholera is in general announced by the gradual or sudden cessation of the vomiting and dejections, without any increase of the local pains and spasmodic symptoms. In intense epidemic Cholera, the appearance of bile in the matter evacuated from the stomach and intestines, and particularly from the latter, is an ordinary and tolerably correct index of the approaching cessation of the evacuations, and diminution of the sympathetic symptoms. On the contrary, if the bile does not appear, and the nervous symptoms increase and multiply, there is very little chance of saving the patient.

The symptoms of Cholera are sometimes united with, or succeeded by those denoting the presence of inflammation; such as, besides an excessive thirst, an increase of the epigastric, umbilical, in a word, of the abdominal pain, when pressure is exerted on the sensible point, dry heat of the skin, hardness and frequency of the pulse, when even it preserves its smallness. This fact was remarked by M. Alexander Turnbull Christie, in the epidemic Cholera at Darwarar.† It is frequently observed in sporadic Cholera.

* Observations sur le Cholera Morbus. Moscow, 1830.
† *Observations on Cholera.* Edinburgh, 1828, p. 88.

On the 17th of June last, I was called to a young lady, in the habitual enjoyment of good health, who, without any known cause, was suddenly attacked, the preceding night, with nausea and vertigo; she vomited, and at the same time discharged by stool, a remarkable quantity of bile, then clear and thready mucosities, and afterwards fell into a state of extreme debility. On my arrival, I found the abdomen very painful on pressure in nearly its whole extent; the tongue somewhat red on its borders, white and moist in the rest of its extent; the skin remarkably hot, except on the hands and feet; occasional and vague chills; pulse hard and concentrated; painful cramps and insupportable pulling sensations in the thighs, and still more so in the calves; thirst intense. Acidulated drinks, given in small quantities, the application of leeches to the abdomen, cataplasms and a bath, caused a cessation of the pain, thirst, cramps, and debility.

Facts of this kind are very rare.

Certain orders of symptoms prevail in the different cases of Cholera Morbus; and, at first, the only constant ones, those without which no disease can receive this name, are vomiting and dejections combined.

I do not say that in epidemic cholera, these two symptoms are absolutely observed in all patients; sometimes, for example, the vomiting is wanting, at other times, the discharge by stool, and in very rare instances there is no evacuation.

These latter cases have received the ridiculous names of *dry cholera*, *cholera sine cholera*. The truth is, that under such circumstances, there is no Cholera, but only a disease analogous to it.

If we go beyond the symptoms, we shall establish the most foreign comparisons. The importance inherent in the phenomena attending the condition of the organs during life, can only be lessened by the authority of pathological anatomy. We cannot make it yield to views purely theoretical, without exposing ourselves to the most dangerous uncertainties in practical medicine.

The evacuations which characterize Cholera Morbus are soon accompanied or at least followed, either by prostration alone, or by convulsive or tetanic spasms, to which prostration always succeeds; at least, such is the case when the evacuations are violent, repeated and copious, so that we observe the serous discharge obstinately follow the alimentary, bilious, fœcal, and in fine mucous evacuations.

The practitioner should therefore distinguish Cholera according to the nature of the matter evacuated; according as it

determines at the same time the diminution of the sensorial action, and the unnatural exhaltation of external movements; or as, besides obscuring the senses, it is accompanied by profound muscular weakness; or, in fine, according as the disease, having attained its full degree of danger, presents for symptoms prostration, together with a cadaverous aspect, the last scene of an agony, about to terminate in death.

There is a variety of Cholera, which appears to us to merit the serious attention of observers; it is that in which, this disease confounding itself with typhoid affections, the evacuations are promptly followed by a state of profound stupor, ordinarily terminating in loss of life.

The symptoms of Cholera are not always continued. Cases of intermittent Cholera Morbus, or, as it is said, of fatal intermittent choleric fever, are not very uncommon. Sauvages has classed this among the innumerable species of his Nosology, sustaining himself by the observations of Merton, Torti, and Meyscrey. The attacks are usually tertian, rarely quartan. At the commencement, there is violent vomiting of a large quantity of bilious, green matter, and at the same time frequent evacuations by stool, of a similar matter; frequently hiccough; the voice is sharp, acute, shrill, and hoarse; tongue dry; eyes sunk into the orbits; pains and heat in the stomach; forehead covered with perspiration; pulse small, weak, corded, occasionally intermittent; the extremities are cold and livid. This Cholera threatens death at the commencement or soon afterwards.*

A woman went to the country from London at a time in which the intermittent fever prevailed. She then returned to the capital, and was suddenly seized with a violent Cholera. Morton was sent for. The spasm and abundant evacuations from the stomach and intestines were such that her life was endangered; the extremities were cold; pulse irregular, scarcely sensible; the patient labored under prostration bordering on syncopy; after the attack, the urine was red, and resembled brick dust. The next morning, another paroxysm not less violent. The patient was more particular in following the advice of her physician, and the symptoms did not return.

According to Stark, a female was affected regularly every eight days with vomiting and alvine dejections, together with great heat, ardent thirst, black and dry tongue, ringing in the ears, and frequent syncopy; the urine was turbid, and left a lateritious deposit; abundant sweats, possessing an odor analogous to that ex-

* *Pyrétologie Physiologique*, 4th edit. 1831.

haled from individuals affected with intermittent fever. Stark cites a second case of this kind. Both yielded to a methodical treatment.

Cholera Morbus may likewise show itself with the remittent type.

A woman, aged forty-eight years, was attacked in the month of October, 1760, with a remittent fever, during the paroxysms of which she discharged more than twenty times through her mouth and at the same time by stool, a mixture of bile and serum, of a variable color. These evacuations were, at intervals more or less distant, accompanied by excruciating pains in the stomach and intestines; in the remissions, the evacuations continued, and, during this time, they were more rare. Lautter effected the cure by means of the treatment generally employed in pernicious periodical diseases.*

But it is time to enter upon the consideration of the present state of pathological anatomy in reference to Cholera Morbus.

* *Mongellaz, Essai sur les irritations intermittentes.* Paris, 1821, t. 1. p. 275.

CHAPTER II.

RESULTS OF THE AUTOPSICAL EXAMINATION OF BODIES AFFECTED WITH CHOLERA MORBUS.

If we had comprised, under the name of Cholera, the vomiting and dejections induced by poisonous substances taken voluntarily or by carelessness, administered by an imprudent or criminal hand, we would have been obliged to mention in this place all the anatomical details into which Professor Orfila has entered in reference to each of these destructive agents.* But in the present work we treat of Cholera, which is independent of causes of this nature; we shall, however, establish between this disease and poisoning a comparison which cannot but prove useful.

Morgagni has been silent upon the subject of Cholera Morbus. However, some ancient anatomists have left us details respecting the opening of cadavera, which, from their title at least, we may imagine to refer to Cholera Morbus. Thus, Bartholin found the stomach descending as far as the ischium, a red worm in the intestinal tube, the spleen double its ordinary volume, and the ductus choledochus divided into several branches. Riolan assures us that he saw the liver shrivelled, the vesicle filled with bile, and the ductus choledochus much dilated. Diemerbroeck found the bile in great quantity in the vesicle, whilst there was little or none in the stomach. Th. Bonet observed the lobes of the liver to be black, the vesicle dilated, filled with dark green bile, and the biliary parietes distended by this liquid. Cabrol remarked, in one case of Cholera, that the ductus choledochus entered near the pylorus, so that the bile was thrown into the stomach, as well as into the duodenum.

The *Acts* of Medicine of Berlin mention that, after a fatal case of Cholera, the duodenum and pylorus were in a gangrenous state, filled with a mixture of blood and bile, of a blackish yellow, similar to the matter evacuated during life; the vessels of the stomach were gorged with blood, the vesicle flaccid, and the epiploon folded over towards the stomach.†

What are we to conclude from these observations? Nothing, until they shall have been associated with a great number of others, which will confirm their value.

* *Toxicologie générale*, 3d. edit. Paris, 1826, 2d vol.

† Sengensse, *op. cit.* p. 36.

Hoffman has nevertheless thought himself justified to conclude from these facts, so imperfectly given, that after Cholera we will find the intestines, principally the small ones, and especially the duodenum, as also the right orifice of the stomach, gangrenous interiorly; that exteriorly there will be an effusion of yellow bile, and a remarkable relaxation in the biliary ducts.

Sauvages mentions but one case of autopsical examination; it was an instance of Cholera with jaundice, produced by poisonous mushrooms. Death occurred on the sixth day. There was a trifling phlogosis of the stomach; the duodenum was considerably distended by gas, and strangulated at its inferior portion; the liver was red, and distended by blood; the ductus choledochus was strangulated in its middle, swollen and empty at its inferior part; the bile in the vesicle was green and black, and the intestines were empty and sound.

Lieutaud states that, after an attack of Cholera, the liver was found shrivelled; in another instance it was steatomatous; the spleen was double its usual size, the pancreas schirrous, the vesicle full of biliary calculi, the intestine ileon black and sphacelated, together with an effusion of black bile in the abdomen.*

We observed in the preceding chapter, that Pinel indicated gangrene as a proof, furnished by *post mortem* examinations, of the inflammatory character of Cholera in cases in which it proves fatal.

Geoffrey mentioned as phenomena remarked after death—the dilatation of the biliary vesicle and ductus choledochus; the presence of bile in the small intestines, and particularly in the duodenum; often gangrene of this intestine and pylorus; the injection of the veins of the stomach; and sometimes inflammation of this viscus and liver.

It is evident that the knowledge of pathological anatomy in reference to this disease was very limited, before 1817. The extensive ravages of the Cholera in India appear to have so interested mankind, as to have placed this branch of human science on a level with the others.

However, it appeared at first that the examination of cadavera would furnish but little light in relation to the nature and seat of Cholera. Thus, at Calcutta, in 1818, according to Mr. Hachard, the viscera were found to be in nearly a natural condition; a few violet, brown, and black spots were observed on the gastro-intestinal mucous membrane; the biliary vesicle was empty and contracted; the brain sound, and in one case only a slight effusion

* *Hist. Anat. Med.* t. ii. p. 534.

was observed.* At Manilla, in 1820, M. Charles Benoit found no traces of inflammation in any one of twenty cadavera which were opened; three only presented congestion of the brain.† Even in 1828, M. Mouat stated that after a minute examination of bodies at Calcutta, he was unable to discover any other lesions than a sanguineous engorgement and red color of the brain, lungs, liver, stomach, and intestines.‡ These facts do not throw much light on the nature of Cholera, or rather they obscure the veil which covered it. But we shall soon have documents of more value.

M. Gravier assures us, that he has never met with any alteration in the brain or chest, but he has observed the internal membrane of the œsophagus inflamed, and the cardiac orifice of a violet red color; the mucous membrane of the stomach, in its whole extent, thick and of a gangrenous brown; in one case he found it ulcerated, and it could be separated easily from the muscular coat; the patient lived for three days. In the case of an old woman, who had vomited a quantity of worms, he observed the stomach to be perforated. The duodenum presented the same aspect as the stomach; the redness went on diminishing in the small intestine, but all the traces of inflammation were manifest in the cœcum and colon. The stomach and intestines were empty; the bladder was inflamed, and hardened like rumpled parchment. In general, the evidences of inflammation were less apparent in the cadavera of individuals who had died suddenly, and who had fallen victims rather to the pain and intensity of the convulsive spasms than to any disorganization of the viscera. The liver did not ordinarily present any marks of inflammation.

M. Quesnel has described, with care, the results of the autopsical examinations made in the Isle of France, during the Cholera of 1819. When the disease manifested itself by the characters which he assigns to the first degree, the features were found emaciated, and the abdomen retracted; the epiploon inflamed, curled up, and sometimes adhering; contraction of the stomach and inflammation of the mucous membrane; inflammation and extreme contraction of the large intestines, and sometimes of the whole intestinal canal; engorgement of the liver and spleen; the vesicle filled with blackish bile; phlogosis of the bladder and thickening of its parietes. The only lesion observed in the chest was in some subjects an inflammation of the serous membrane of the pericardium. The encephalic cavity presented nothing particular. There was no trace of any lesions remarked in persons

* Paris, 1820. † Montpelier, 1827. ‡ *Gazette de Santé*, Mai, 1829.

who had died very suddenly. When the patient had experienced the disease in the second degree, the result on dissection was nearly the same as in the first, except, however, that the epiploon was generally sound, and the gastro-intestinal mucous membrane offered, in its whole extent, gangrenous spots and sometimes ulcerations.

In the Isle of France, M. Guillemeau found, after Cholera, the brain sound, the lungs in their natural state, and the right cavities of the heart filled with black blood; whilst the left cavities of this viscus were empty. The stomach presented various alterations; its vessels were injected at the point in which phlogosis existed; the mucous membrane was at times diseased in different parts, and particularly near its orifices, which sometimes appeared contracted. This organ preserved the fluids almost unchanged. The small intestines were in general healthy; whilst the coats of the large intestines were thickened. These last phenomena were the more marked in proportion as the disease had been more protracted.*

At Bourbon, M. Labrousse having opened the bodies of ten negroes, who had died in the space of twelve hours, found them excessively emaciated, although the individuals had been robust before their disease; there was no appearance of putrefaction. In some of them the brain did not present any alteration; in others, on the contrary, its substance was softer than usual; the longitudinal sinus was gorged with blood, and the superior ventricles contained a small quantity of sanguineous serosity. The lungs were sound; the pericardium contained a little serosity; the heart was somewhat larger than ordinary; the coronary vessels were filled with very black blood: the left ventricle was empty, and the right generally filled with black and coagulated blood; there was no adhesion observed in the thorax. The gastro-colic epiploon, and the external surface of the intestines and mesentery, presented a slight phlogosis and a considerable fullness of their vessels. The vesicle of the liver, very much distended, contained black and thick bile; nothing particular was remarked in the ductus hepaticus, cysticus, and choledochus. The bladder was unusually contracted and in a state of perfect vacuity. The stomach was distended by gas; in several of the subjects, it was empty; in others it contained a viscid, whitish, greyish liquid together with worms. The gastro-intestinal mucous membrane was sound in some of the individuals, whilst in others it presented an intense phlogosis, increasing from the pylorus to the rectum.

* Keraudren, *op. cit.*

The other tunics participated in the inflammation, except those of the jejunum and ileon; their cavity contained a sero purulent liquid, and in some cases the vermes lumbricales.

The examination of ten other negroes, who died during the first four days of the disease, after vomiting and stools of heterogeneous matter, accompanied by cardialgia and colic, presented nearly the same phenomena in the three splanchnic cavities, except that the phlegmasia was more intense. Gangrenous spots were observed in the small intestines, and the matter contained in their cavity was the same as that of the dejections.*

According to M. A. Turnbull Christie, the alterations of the mucous system are alone invariable, and all the others appear to him merely secondary. He has always found a whitish, opaque and viscid substance, adhering to the surface of several portions of the mucous membranes; and, in several cases, this substance was so abundant in the intestines, that it filled a greater or less portion of them. The stomach and a part of the intestines were filled with a serosity, either thick or transparent, and often intimately mixed with the matter already mentioned; at other times, this floated in the shape of flocculi in the liquid. The mucous membranes, when not inflamed, presented an extraordinary whiteness. It was frequently soft and pulpy, and, in general, especially in the stomach and small intestines, it was easily detached under the form of a thick pulp. This was sometimes only partial, but, in the majority of cases, it occupied the whole extent of the alimentary canal; the mucous membrane of the bladder and ureter, and, on two or three occasions, that of the lungs, offered the same appearances. The matter of which we have spoken did not always present the aspect just described. It was sometimes grey or green, and at times had the color and consistence of cream, and then it resembled pus. In some few cases, which M. Christie has not observed, this matter was sanguineous.

This author mentions the following alterations as being frequently united with those just indicated—a venous congestion in the viscera, particularly in those of the abdomen; a deep coloration of the blood in the veins, and sometimes in the left cavities of the heart; the inflammation of certain parts of the mucous membranes, especially at the pyloric extremity of the stomach and in the small intestines. In some cases, no inflammation is discovered. The redness observed does not appear to be lways attributable to inflammation; it depends generally, according to him, on congestion.†

* Keraudren, *op. cit.* † *Op. cit*, p. 43.

M. Scott states the following as the results of his autopsical examinations:—the mucous membranes exhibited signs of disease. The lungs were often entirely shrunk, and the left cavities of the heart filled with black blood. A serous matter was observed in the intestines. There was no chyle in the thoracic canal. The bladder was empty and considerably contracted; its mucous membrane, as also that of the urinary ducts, was lined by a glairy and whitish liquid. In one case only, the spinal marrow was examined; it was very much inflamed.*

M. Orton describes, in the following terms, the alterations, which he has ordinarily remarked after Cholera Morbus:—a deep blue or livid color was observed on the different parts of the body, according to the individuals, but more remarkable on the extremities, and more evident in sanguineous and robust subjects, who had died suddenly. The venous and arterial blood was of a darker color than usual; the internal organs were in general very much gorged with blood, more abundant in the veins of the mesentery, stomach and lungs; several extensive spots of a crimson color occupied the internal surface of the stomach. Similar alterations existed in the intestines; they were more apparent on the internal surface and in the small than large intestines. The stomach contained substances ingested in large quantity a few hours before death; the calomel was frequently found, in the midst of the liquid contained in the digestive organs, or adhering to different portions of the mucous membrane. The intestines were in great part empty; their contents, ordinarily deprived of bile, consisted principally of whitish, turbid mucus, resembling thick barley water, slightly mixed with milk; the broad portions of the intestines were frequently contracted so as to admit with difficulty the finger into their cavity, particularly the large intestines. The biliary vesicle contained a natural quantity of bile without any other remarkable peculiarity; the biliary canals were free, and the bile flowed easily into the duodenum when the vesicle was pressed upon. The bladder was ordinarily contracted, to the size of a hen's egg, without a drop of urine; the veins of the encephalon were very much distended by black blood; the small arteries of the dura mater and membranes were frequently injected; and blood was found effused on the surface of the brain.

The medical bureau of Madras indicates as alterations found after death, the inflammation and collection of blood in the stomach, intestines and other abdominal viscera, sometimes in the

* *Bibliothéque Universel.* (Genève,) Juillet, 1831, p. 294.

brain itself; and the contraction of the bladder. In one case, the stomach and intestines were found to be inflamed, and their structure so much altered that the coats were lacerated by the slightest contact; the duodenum was remarkably contracted.

The medical bureau of Bengal mentions an excessive congestion of the internal veins, inflammation, and the effusion of a coagulated lymph.

Doctor Burrell found the liver of a deep color, distended by blood, and the vesicle filled with bile; the spleen remarkably blue; the epiploon inflamed, and the veins entirely gorged; the small arteries of the intestines of a livid red color; the colon so far contracted as not to equal half the size of a finger, and it was necessary to open its parietes in order to introduce the handle of the scalpel into their cavity. The veins of the great curvature of the stomach were of a size somewhat less than a goose-quill, and more apparent interiorly than on the outside of this viscus; the strongest injection could not penetrate these vessels; those of the mesentery and other parts presented an analogous character. The lungs were of a dark color and gorged with blood, which no doubt was the cause of the rumbling and laborious respiration observed in the majority of cases terminating in death.

M. Craw, after a Cholera of eighteen hours, found the vessels of the stomach, duodenum, those of all the rest of the alimentary canal and mesentery, the liver and lungs astonishingly gorged with blood and distended by this fluid; several of the veins, especially of the stomach, equalled in volume a raven's quill, and the small ramifications of the arteries were likewise distended. The arch of the colon was very much contracted.

M. Whyte observed, in a case in which the disease had continued for nineteen hours, the liver increased in volume and full of blood. The vesicle was nearly full; the stomach presented a dark color, which at first view, might easily have been taken for gangrene; the small intestines had the same appearance, and the same error might have been readily committed, but both were perfectly firm. The colon, contracted and reduced to the size of a finger, was pale when compared to the deep color of the stomach and intestines, produced by the fullness of their small veins. The lungs were of a darker color than usual, approaching to that of the liver; the bladder was empty.

In a case of Cholera, which continued for thirty-eight hours, and during which the patient labored under coma for twenty-four hours before death, the same dark color of the stomach was observed, but without any distension of the principal veins. A portion of the ileon, eighteen inches from the head of the cœcum,

with the corresponding portion of the mesentery, was perfectly black and gangrenous in appearance. The colon was altered throughout, as well as the stomach and superior part of the small intestines. Although the inferior portion was not mentioned so particularly, it appears that it was in an intermediate state between venous congestion and arterial inflammation.

In examining the upper part of the cranium, the dura mater was found to be inflamed, and its vascular trunks in a good state; the veins of the pia mater were so much distended that they appeared to be on the point of bursting; they were spread in all directions over the circumvolutions of the superior hemisphere, which explained sufficiently the coma that had been observed; several of the small arteries were injected, but not so much so as to decide whether there had been inflammation; there was no serosity discovered in the ventricles.

In another case, in which there were sudden symptoms of coma, great derangement of the head, considerable anxiety, oppression, difficulty of respiring, coldness of the hands, arms, and inferior extremities, while the rest of the body preserved its natural temperature, powerful stimulants were administered, blisters applied to the epigastrium and neck, together with leeches to the forehead—these last did not draw any blood, and the patient died. On opening the body, there was a sanguinous congestion in the abdomen and thorax, as in the preceding case; but there were large spots of blood extravasated on the different points of the intestinal canal, and on others there were evidences of increased arterial action; a great portion of the ileon and colon was completely gangrenous; the vessels of the brain and its membranes were distended by blood; there was no effusion of serosity either on the surface or in the ventricles. Thus, in the space of from twenty to thirty hours, there was not only the formation of a congestive disease, but inflammation, and even gangrene were developed.

When the spinal marrow was examined, the same vascular congestion of which we have just spoken was found to exist in it.*

M. Annesly deserves our thanks for the great care he has exhibited in describing the autopsical examinations made under his eyes.

The extremities were wrinkled and contracted, the surface of the body livid, the lips and other parts covered by a mucous membrane of a black purple color. The soft parts were contracted, the eyes sunk, and the features profoundly changed, considering the short duration of the disease.

* Searle, *Cholera, its nature, cause, and treatment.* London 1830, p. 27–34 Suppl. 1831.

The sinuses together with the veins of the brain and its membranes were filled with black, thick, viscid blood; the arachnoidea was often opaque, slightly thickened and adhering. A serous and gelatinous effusion was repeatedly observed in the ventricles and meninges. The cerebral substance, sometimes soft and pulpy, rarely presented evidences of increased action. The sanguineous congestion and serous effusion were the more marked in proportion as, during life, stupor, deafness, vertigo, and ringing in the ears had been more developed.

The heart and large venous trunks were generally distended by thick and black blood, in certain cases liquid, and in others semi-liquid, which, when coagulated, assumed the aspect of black jelly. The substance of the heart was sometimes very soft, and more easily torn than in its ordinary state.

The lungs were generally gorged with black blood, heavier than usual, and appeared hepatized or bruised; the pleura was ordinarily pale and unchanged. The pericardium, in its natural condition, sometimes contained a small quantity of serosity.

M. Annesly has remarked that the correspondence of these alterations with the state of respiration and circulation, observed during life, appeared evident, and that these lesions were in proportion to the difficulty experienced in the exercise of the above functions. He admits that a part of these disorders may have been the effect of death; but he contends that the majority of them were produced by the debility occasioned, from the commencement, in the organs in which they were observed, and that they themselves contributed to a fatal termination.

On opening the abdomen, a disagreeable odor, peculiar to this disease, was exhaled, and this fact has likewise been remarked by M. J. Jamieson, at Bengal; this odor was especially recognised when death had been sudden.

The stomach usually contained more or less liquid, aqueous, thick, and sometimes grumous. The aspect of this liquid varied; sometimes it was colorless; at other times it was green or yellow, and in certain cases brown, bordering on black. The peritoneal surface of the stomach rarely offered any other character than a degree of venous congestion greater than ordinary. The internal surface of this viscus was sometimes covered by a dark-colored glairy fluid, which, when raised, presented to the view a considerable capillary congestion. This congestion appeared to reside principally in the sub-mucous cellular tissue, and in certain points it was so extensive that it offered the appearance of an ecchymosis of this tissue. The mucous membrane was occasionally

considerably wrinkled, and appeared thick and soft to the touch, more especially when it was not very much distended by liquid or gas. The stomach was frequently flaccid, and its tunics were traversed more easily than usual by the fingers of the anatomist. In those cases in which there was some re-action manifested, the internal surface of this viscus, particularly towards the pylorus, exhibited a more lively color, approaching to red, and appeared thick and contracted.

The epiploon was sometimes contracted and thrown to one side of the abdomen.

The small intestines were, at times, constricted in certain points, often distended by gas, and their veins were generally filled with black blood. Externally, they appeared soft, thick, and their color presented all the varieties, from a pale red to a black purple; the first was remarked more particularly on the peritoneal surface of the duodenum and jejunum, and the latter on the ileon as far as the cœcum. This difference of color appeared to be due to the various degrees of congestion of the capillaries and veins in the different parts of the intestines, and also to the injection of the arterial capillaries, and color of the blood contained in these vessels.

When the small intestines were opened, their coats appeared thick, especially when they were not distended, or when they were contracted to a certain extent; they were often observed to be flaccid and more readily torn than under ordinary circumstances. Their internal surface was generally covered by a thick, viscid substance, the color of clay, which sometimes assumed a cream or yellowish hue. This was observed in those persons especially who had died after a sudden and short attack of the disease. When this matter was removed, the mucous membrane appeared pale at the superior part of the small intestines, brown and congested at the inferior part, particularly when the ileon was blue or purple exteriorly. When the disease had continued for a long time, and especially when re-action had manifested itself, a viscid paste, detached to a greater or less extent, floated in the fluids contained in the small and large intestines; the mucous membrane appeared more vascular, and the arterial capillaries seemed more injected than in the other cases.

The large intestines were frequently contracted, sometimes distended, at other times contracted and distended at different points. The congestion of the veins and venous capillaries was generally evident, particularly in the cellular tissue, interposed between the coats. The external membrane was commonly of a brown aspect, owing to the black color of the blood accumulated in the vessels. The internal surface was frequently very vascular,

sometimes of a brownish red, particularly if the patient had survived for any length of time, and potent stimulants had been administered. These intestines did not contain any fecal matter, and the fluids observed in them were generally similar to those found in the stomach and small intestines.

M. Annesly is of opinion that there exists an intimate relation between the vascular congestion of the small intestines and the symptoms observed at the umbilicus, during life. The irregular contractions and dilatation of the intestinal tube, as also the presence of gas in its cavity, appear to him to be closely connected with the first pains of colic. According to him, these pains should be considered as indicating the first period of those alterations, the origin of which is traced to a want of vital energy, induced by the morbid character of the blood, circulating in these parts.

The liver was generally browner than usual, and gorged with thick, black blood; it was sometimes of a purple or blue color, approaching to brown; at other times it resembled marble, was increased in size, flaccid, and easily lacerated.

The biliary vesicle was always distended by viscid bile, generally of a brownish green or black, in subjects who had died without having had any appearance of bile in the evacuations; and although the biliary canals were large and permeable, the orifice of the ductus choledochus was usually constricted, and rarely permitted the bile to flow into the duodenum, unless considerable pressure was exerted on the vesicle. In those cases in which, the disease being prolonged, re-action had come on and bile had appeared in the evacuations, the vesicle was generally empty, or it contained but a very small quantity of ordinary bile; and the ductus choledochus, although not always exempt from a partial constriction, was usually more permeable than in the instance previously mentioned. In a few cases, the vesicle was flaccid and empty. In the majority of those cases in which the bile had been remarked in the evacuations, and the vesicle found empty on opening the body, and consequently where it was natural to infer that this liquid had passed into the intestines during the life of the patient, the viscid matter lining the internal surface of the small intestines was detached in greater or less extent, and floated in the midst of the liquid contained in the large intestines, or was entirely expelled with the rest of the evacuated matter.

The spleen was generally enlarged and gorged with black blood; and it was frequently soft. In some cases it fell into pieces whilst examining it, in consequence of its too great distension, or an excessive relaxation or softening of its tissue; its color was darker than usual.

The kidneys were in a natural state and free from any derangement, which could interrupt the course of the urine. The bladder was ordinarily empty, and contracted under the pubis. Its internal surface was frequently covered by a considerable quantity of mucosities.

The *venæ cavæ*, veins near the heart, *venæ portæ*, mesenteric, iliac, and subclavian veins, together with the sinuses of the dura mater, were filled with a black, thick, and viscid blood. The right cavities of the heart were generally distended by blood of the same aspect; and when there was any in the left cavities, it presented a similar appearance. The lungs were completely gorged with thick, viscid, black blood, similar to tar; and all the viscera presented a greater or less degree of sanguineous congestion, offering nearly the same characters. The vessels of the surface of the body and extremities were generally contracted and empty.

M. Vos, academician of Batavia, mentions that after Cholera, he has almost always found the viscera in their natural condition in subjects who had died suddenly, except that the intestinal canal was flaccid and more pale than usual; but if the evacuations from the stomach and by stool, had already continued some time, then this canal was found considerably injected and of a dark red color, which occurred more commonly in the small than in the large intestines; that the mucous membrane of the œsophagus was sometimes observed to be in the same state and ulcerated, whilst the stomach was frequently constricted, thick, and hard; that when the disease had continued for a long time, congestions were observed in the large vessels of the abdomen, enlarged in a remarkable manner, as likewise in the liver and spleen; that the lungs were, at the same time, black and heavy, and the brain was in its natural state, especially in such as had died suddenly, whilst it presented, in the contrary cases, evidences of congestion.*

M. de Hubenthal describes in the following terms the results of autopsical examinations in Russia:—engorgement o fthe sanguineous vessels in the organs essential to life, without extravasation or inflammation, or phenomena indicating the latter. The blood was stagnant, decomposed, and exhibited signs of commencing putrefaction. On opening the cranium, he observed the meninges to be red, the sanguineous vessels of the brain surcharged with thick blood, of a dark color; effusion in the ventricles, and little or no serosity. The interior of the vertebral column presented the same phenomena. The lungs were filled with black blood;

* Fodéré, *Recherches sur le Cholera Morbus*, Paris, 1831, p. 185.

their texture altered in several places, and adhesions with the thorax; the heart was filled with blood half-coagulated; its substance softened; collections of white coagulated matter in the ventricles; the coronary arteries and veins were distended with black blood. The epiploon and diaphragm were slightly red; the stomach and intestines, particularly the small, extremely so; here and there, evidences of commencing putrefaction were observed; the stomach was filled with water, and the intestines distended by air; the liver gorged with black blood; and the vesicle ordinarily filled with black bile, and rarely empty; the ductus choledochus always closed; the spleen hard in persons who had died suddenly, friable in such as had been a long time sick; the short vessels were always surcharged with blood; the kidneys contained dark urine; and the bladder was slightly red, most commonly empty.*

M. Pipirou, having opened a cadaver at Orenbourg, observed the following appearances: the body was covered with olive spots, and ready to pass to a state of decomposition, although death was recent; muscles flat and soft; the lungs contracted, and not containing any blood; the digestive tube was in its natural state and empty, except the duodenum, which was of a bluish red, filled with blackish blood, together with a yellow and mucous matter; the liver was covered with yellow spots; and the system of the *vena portæ*, gorged with black blood; the vesicle was filled with bile and the bladder with urine.†

On opening bodies the arterial and venous blood has been observed to be thick, tenacious, and much darker than usual, continuing liquid a long time after death; the veins have sometimes been found inflamed.‡

The following alterations have been observed by M. Keir, at Moscow:—in general, the extremities were more or less livid and contracted; the skin of the hands and feet was hard and horn-like; the features were profoundly altered; the vessels of the brain and its envelopes gorged with blood, particularly at the base of the cranium; the arachnoidea was sometimes opaque in several points, and adhered to the pia mater; sometimes a liquid was effused in small quantity between the convolutions and in the lateral ventricles; the vessels of the spinal marrow were more or less filled with blood, which was often effused between the arachnoidea and dura mater; points of *ramollissement* existed in the substance of the spinal marrow, and traces of congestion were observed in the large nervous trunks; the lungs were generally

* *Journal de Médécine*, Juillet, 1831. † Fodéré, p. 195.
‡ Memoire sur le Choléra, lu à l'académie, le 7 Decembre, 1830.

gorged with black blood, as also the cavities of the heart, which sometimes contained fibrinous concretions; the trunk of the aorta and other arteries were filled with blood of a brown color, which, placed on a white surface, presented the most marked cherry color. The stomach and different parts of the intestines were contracted in a remarkable degree. The external surface of the stomach appeared in certain cases to be but slightly altered. A whitish or yellow liquid was often found on the different points of the alimentary canal, which sometimes contained a quantity of gas. In all cases, the stomach and intestines offered, interiorly, evidences of congestion, and of a sub-inflammatory condition; there were brown spots, of a variable extent, affecting the whole internal circumference of the intestines. The color of these parts varied considerably, from the dark color of venous congestion to the roseate hue of inflammation. In one case, the internal surface of the stomach was so dark that it might have been imagined to be affected with gangrene. In examining the organ placed between the eye and light, it was evident that this color was owing to the accumulation of black blood in its vessels; the patient died with typhoid symptoms, after having presented all those of Cholera. The stomach and intestines were frequently of a paler color than usual, both externally and internally. The liver was, in general, gorged with black blood; the vesicle often very much distended by yellow and tenacious bile. The biliary ducts were sometimes contracted, at other times perfectly free; the pancreas, spleen, and kidneys were occasionally filled with blood; and the bladder was nearly always empty. The uterus was in a sound state.

The anatomical lesions observed by M. Gœury, at Varsovie, are the following:—Engorgement of the whole vascular system; the blood deprived of serosity and curdled; the arteries filled with black blood; twenty-four hours after death, albuminous concretions were observed; the heart was ordinarily more voluminous than in its natural state, and always contained albuminous concretions when opened twenty-four hours after death; if the examination is made two hours after death, the blood will be found liquid and venous. The heart was once found deprived of blood by M. Sandres, at Nacz-Pold.*

M. M. Brière and Legallois give the following details of a post mortem examination:—The rigidity was very considerable. The superficial tunic of the intestines had a roseate color. The blood which flowed from the vessels was generally liquid, abundant and black. The stomach presented spots of a livid red, and injections

* *Memoire de Médécine Militaire.*

of the same color; it was filled with thick, yellow, and viscid mucus; its villous membrane was easily detached. The superior portion of the small intestines contained a large quantity of thick mucus, similar to that of the stomach. In proportion as the intestines were examined in their length, this mucus became whiter; and sometimes it presented a yellow color. The quantity of matter secreted was very considerable. There were partial injections of the small intestines, tumefaction, of rather considerable extent, and several red spots more or less marked. The intestines imparted a sensation of *empâtement* to the fingers. and small sandy bodies were distinguished at different points; a whitish, thick and viscid, matter was observed in the large intestine, which, in one portion, had a purulent aspect; near the termination of the intestine, this matter resembled peas-soup. The bladder, sightly injected, likewise contained this whitish mucus, which was also found in the nasal fossæ and œsophagus; the lungs were generally gorged; the brain was injected, and of a softer consistence than natural; the blood was liquid and abundant in the splanchnic cavities. The same alterations existed in a second subject, only the mucus was mixed with a sanguineous exhalation.*

According to M. Remer, the following results have been obtained at Varsovie, from the opening of bodies:—

The sinuses and vessels of the meninges were filled with black blood, as also the brain, without any other change, except that the blood flowed from them when they were cut into. The ventricles contained little or no serosity. The rachidien membranes were, in some cases, furnished with numerous blood vessels considerably developed, and the spinal marrow was gorged with blood. The vertebral canal, in all the subjects, contained a serous effusion, amounting sometimes to two ounces, of a light color, and extending between the dura mater and arachnoidea as far as the last dorsal and first lumbar vertebræ, above the *cauda equina*. The filaments composing this termination of the spinal marrow were usually red, and furnished with blood vessels considerably enlarged. The pleura was sometimes found adhering. The lungs were sound, filled with air and a quantity of black, thick, and viscid blood. The pericardium contained but little serosity. The right half of the heart was unusually developed, the left flaccid and collapsed. The left ventricle contained a medium quantity of black and tarlike blood, half coagulated, and sometimes also concretions of coagulable lymph; the right contained an enormous quantity of liquid, viscid, dark-colored

* Gazette Medicale, 7th Mai, 1831.

blood, resembling tar. A small quantity of blood was found in the aorta; the *venæ cavæ* and pulmonary artery contained considerable blood, similar to that in the right cavities of the heart.

The epiploon was sometimes thrown to one side, and its vessels as also those of the mesentery, appeared to have more blood than ordinary. The external surface of the stomach and intestines was of a light red color; sometimes this redness was more evident, particularly at the inferior part, near the rectum, especially when the disease had continued for some time. M. Remer states that this redness was never so considerable as in the real abdominal phlegmasiæ or typhoid fevers. The mucous membrane of the stomach offered prominent folds, which were partially spotted, but scarcely ever red. The same thing was observed on the mucous membrane of the small intestines; but this in all the cadavera, offered a gelatinous *ramollissement* more or less evident, which could not be raised without injuring this membrane. Towards the inferior extremity, the redness increased in certain cases, and spots of a bright red became more numerous on the mucous membrane; this redness was even very considerable at the inferior portion of the large intestine; but Mr. Remer states that it never appeared to him so intense as to characterize inflammation. The stomach and intestinal canal contained, from one end to the other, the white mucous or greyish matter excreted through the mouth and by stool, but it was somewhat more consistent than during life. In the ileon, descending colon and rectum, it presented a chocolate color. It was so abundant that it filled, if indeed it did not distend, the intestines in their whole length. However, this matter was wanting in some cadavera; the intestinal canal then contained the abundant drinks taken before death. The liver likewise had more blood than usual. The vesicle was very large, prominent below the inferior border of the liver, and gorged with thick, viscid, thready bile, of a dark green color, bordering on black. M. Reimer has never observed the ductus choledochus constricted. There was never any bile in the stomach and intestines, except in such subjects as had died, not only of Cholera Morbus, but also in consequence of other complicated affections. The pancreas was sound. The spleen was not filled with an unusual quantity of blood; it was always smaller than ordinary, and the kidneys were tolerably distended. The bladder was always remarkably contracted, and frequently smaller than a pullet's egg; its walls were so thick that they offered considerable resistance to the knife, being more than two lines in diameter; its mucous membrane was considerably wrin-

kled; the cavity of this viscus did not contain the least vestige of urine, but only a few drops of a whitish, tolerably thick mucus, altogether similar to that of the intestines. The *venæ cavæ* and all the abdominal venous trunks were gorged with blood, in the same manner as was mentioned above. The uterus and ovaria were sound. On opening the abdomen, and particularly the intestines, there was a very feeble odor emitted, which possessed nothing revolting.

M. Remer adds that after the Cholera, which he terms inflammatory—because, at the commencement, the pulse is frequent, hard, sometimes full, the skin hot, pains in the abdomen, felt principally around the umbilicus, tearing and excruciating, and continuing when all the other symptoms of Cholera are developed —we will find a very considerable congestion of blood towards the bas-ventre; the intestinal canal, and especially the mucous membrane of the stomach, ileon, and of the entire large intestine, will present an intense redness, which continues to increase as far as the rectum, where it is more considerable than elsewhere.*

I am indebted to the friendship of M. Londe, for the following details connected with the opening of cadavera, either by himself, or in his presence, during his stay in Poland. †

The color of the body after an individual has died with Cholera, scarcely differs from that presented in the living subject affected with this disease—it is dull, grey, a mixture of white and blue, or black. Spots and ecchymoses are often observed on the legs. The abdomen is ordinarily approximated to the vertebral column. The cadavera possess at first remarkable suppleness in the articulations; they afterwards become very rigid. Persons who have died with Cholera, when carried to the room consecrated to the dead, have, it is said, moved one or several of their limbs. The internal heat of the cadavera continues for a long time after the external has ceased, and it is succeeded by considerable coldness. The blood flows from the incisions, especially on the dorsal region. The brain, as also the rachidien prolongation, are most usually in their natural state; sometimes their consistence is increased; at other times it is diminished; their blood-vessels, and principally those of the pia-mater are considerably injected even as far as the cortical substance. There sometimes exists an infiltration of serosity in the subarachnoidien cellular tissue of the brain; sometimes, also, we find a spoonful of serosity in the lateral ventricles;

* *Observations sur le Choléra épidémique de Varsovie, dans le journal complimentaire des Sciences Medicales.*

† *Extrait de la Relation de sa Mission en Pologne:* a work worthy the attention of every friend to correct observation.

and at times two or three spoonsful in the vertebral arachnoid. A more constant lesion is the injection of the veins, membranes and spinal marrow, whose consistence then appears increased. The pericardium is ordinarily sound, and the heart often soft, principally in weak subjects, or in such as have been sick for a long time. The left cavities of this viscus are empty or contain but little blood, partly liquid, partly coagulated. The right cavities are filled with black and liquid blood. If the arterial system is empty, the venous system is gorged with blood, particularly in the trunks of the cavities, and especially of the abdomen. The trachea, lungs, and pleura are generally sound, only we observe some ancient adhesions of the lungs to the costal pleura, or some alteration in the pulmonary parenchyma. The peritoneum presents somewhat of a dull color on its surface. The entire digestive tube imparts a sensation of *empâtement* to the fingers; the peritoneum does not contain any serosity, and the mesenteric ganglions are more developed than usual in the ileo-cecal region.—The digestive tube contains a small quantity of gas. The spleen is sometimes softened and friable. M. Londe has observed it double its size, and offering a sort of hepatization. The digestive tube being examined internally, the œsophagus is found almost always unaltered. The internal surface of the stomach is covered in several points, with a whitish, opaque, viscid, and adhesive matter, similar to cream cheese. The intestines contain the same substance, sometimes in sufficient abundance to cover a great part of their extent. The stomach and intestines are often filled with a large quantity of serosity, thick or transparent, sometimes mixed with a viscid matter. Sometimes this matter is semi-liquid, greenish and as it were bilious; sometimes also it is yellowish in the intestines. These contain very rarely a small quantity of fecal matter. The ductus choledochus appears, in certain cases to be constricted, and diminished in volume. The interior of the stomach is often wrinkled, and its mucous membrane is rarely white in its whole extent. It is sometimes red on different points, often soft, and is easily lacerated under the form of a thick pulp. The mucous membrane of the intestine is sometimes pale, or reddish only at its superior part. It presents at times sanguineous injections and ecchymoses. It is often intensely red towards the ileo-cecal valve, where a large number of tolerably developed follicles are observed. The mucous membrane of the large intestines sometimes presents reddish striæ, and appears as if excoriated; the sub-mucous cellular tissue, is, in certain subjects, injected on different points of the alimentary canal. The liver is ordinarily sound, but gorged with black blood; at other

times it presents no traces of plethora; in other cases again, it is soft, and friable. The vesicle is distended by bile, sometimes liquid, sometimes very viscid, of a dark green color. The kidneys are sound; the bladder is strongly contracted, empty, and quite concealed behind the pubis; it resembles the uterus or a ball of caoutchouc. Sometimes its mucous membrane, as also that of the ureters, is injected with blood; it often contains a small quantity of coloring matter, resembling clay. The scrotum is sometimes wrinkled, and the testicles are then closely applied to the rings. The trisplanchnic nerve and its ganglions, dissected with care, are, as far as we can judge of them in the actual state of science, in a perfectly healthy condition.

We have already observed that, before the year 1817, pathological anatomy had contributed but little in explaining the nature and seat of Cholera Morbus. We have just seen that several French physicians, but particularly those of England, have enriched the science in this particular. We must now be convinced that Cholera Morbus is far from not leaving any lesions in the cadavera, as has been two frequently imagined; it was not less true to assert that they were so variable that no definite conclusions could be arrived at in reference to them. Some individuals have expressed astonishment that more extraordinary alterations have not been observed in the cadavera. For minds of this stamp, it would be necessary to have specific alterations for a disease, which they considered as specific. So far from searching in Cholera for any specific lesions, we deny that such exist. Let us, therefore, class these lesions as we did the symptoms, and as much as possible in the same order, that we may compare the state of the organs during life with the aspect they present after death. Comparisons of this sort are too much neglected; they are neither so difficult nor unprofitable as is generally imagined; in proceeding in this manner, pathological anatomy becomes the aid of symptomatology, and, by their union, the basis of pathology is completed. In this recapitulation we shall merely mention the most general and constant facts.

Let us now describe the phenomena of Cholera Morbus after death, in the same order that we mentioned its phenomena during life.

Digestive Organs.—On opening the body, a disagreeble and peculiar odor is sometimes exhaled. This cavity preserves its heat for some time; ordinarily, it is not contracted, as it was during life;

The œsophagus is sometimes red on its internal surface;

The stomach is generally flaccid, and sometimes constricted; its parietes, sometimes thickened, generally friable, rarely perforated; its external surface, covered with a vascular net-work filled with blood, the black color of which imparts to it a brown shade; its vessels, injected, and considerably dilated by black blood; its orifices, sometimes constricted; its mucous membrane, at times, of a remarkable whiteness, at other times, of a spotted red, seldom general, and most usually it presents numerous vascular ramifications, very evident and black, and sometimes crimson spots, or red points bordering on brown, especially towards the pylorus; ordinarily wrinkled, soft, pulpy, friable, easily lacerated, and detached from the sub-adjacent membrane, rarely ulcerated, and still more rarely gangrenous; its cavity, seldom empty, containing usually a whitish, grey, viscid, opaque matter, adhering to the mucous membrane, or floating in its cavity, and sometimes filling it up; frequently, a transparent serosity, or which has been rendered turbid by the presence of viscid matter, is dissolved in it, or disseminated in flocculi:

The intestines are contracted or dilated, or contracted at certain points and dilated at others;

The small intestines are red, exteriorly, offering all the varieties, from the rose to a bluish, black purple, from the duodenum to the cœcum; their parietes are thickened, flaccid, and friable; their internal surface is pale at the superior part of the canal, red and brown at the inferior, covered with a thick, viscid, grey, yellowish, cream-like matter, sometimes detached, floating in an abundant serosity, which is rendered turbid and grumous by the presence of this matter; the numerous follicles are very much developed;

The large intestines, thick in their parietes, are injected, brown on their external surface, covered by vascular ramifications, and sometimes of a brownish red color on their internal surface; their mucous membrane is soft, friable, very rarely ulcerated, containing but a small quantity, if any, of fecal matter, and offering the viscid matter and serosity contained in the small intestines and stomach; the arch of the colon is sometimes considerably contracted, so as scarcely to admit the end of the finger.

The mesentery is red and injected; the mesenteric ganglions are sometimes very much developed.

The epiploon is injected, red, adhering or curled up, and thrown to one side of the abdomen.

The liver is ordinarily gorged with black and thick blood, so as to have its volume increased by it; it is flaccid, soft, purple, blue, and brown;

The vesicle is almost always filled with an abundance of green, brown, blackish, thick, and viscid bile.

The biliary canals, especially the choledochus, are constricted, at least in appearance; the orifice of this canal, it is said, is closed rather frequently.

The spleen, gorged with blood, is enlarged, soft, and friable.

Respiratory Organs.—The pleura is pale ,sometimes offering ancient adhesions;

The lungs withered, of a dark color, gorged with black and viscid blood, heavier than usual, and still containing air;

The bronchial mucous membrane is sometimes softened, pulpy, and covered with a viscid matter similar to that in the digestive organs.

Circulatory Organs.—But little serosity in the pericardium; sometimes it is red;

The heart at times is soft and friable, occasionally enlarged by the blood it contains; the right cavities of the heart are usually dilated by black, thick, liquid, or coagulated blood under the form of black jelly; the left cavities either contain no blood, or a very trifling quantity; the coronary vessels are filled with black and coagulated blood.

The venous system is generally gorged with black, liquid, thick, or unctuous blood, particularly in the splanchnic cavities; empty in the extremities.

The arterial system is deprived of blood; the small quantity, which sometimes exists in the aorta is similar to that in the right cavities of the heart.

The kidneys, sound in the great majority of cases, contain a remarkable quantity of blood.

The bladder contracted, reduced to the size of a hen's egg, or even to that of the uterus in a state of vacuity, deeply concealed behind the pubis, is injected on its internal surface, and covered with a white, opaque, viscid matter, without the least vestige of urine, and containing but a small quantity of glairy liquid.

Organs of Sense.—The features are terribly convulsed;

The face grey, blue, and black;

The lips purple, and livid;

The skin soft and wrinkled, of a dark livid blue on the extremities.

Organs of Locomotion.—The cadavera, under ordinary circumstances, preserve flexibility in the limbs for a considerable time; however, the muscles are sometimes contracted, and the body is bent forwards as it was during life.

The intermuscular cellular tissue, as also that of the whole body, is sunk down.

Nervous System.—The spinal marrow is gorged with blood, and its membranes are red and injected;

The trisplanchnic, dissected with care, does not offer any appreciable alteration;

The sinuses and vessels of the encephalic meninges are ordinarily distended with viscid and black blood.

Blood is sometimes effused on the surface of the brain;

Sometimes, a serous or gelatinous effusion, generally not very abundant, exists in the ventricles and between the meninges;

The arachnoid is often opaque, thick, and adhering;

The cerebral substance is occasionally softened and pulpy.

It cannot now be said, that pathological anatomy has furnished us with nothing positive in reference to Cholera Morbus, and that this disease does not leave any constant lesions. Certainly, we have here profound disorders, and do not let us hesitate to say it, strongly characteristic. They are not all peculiar to this disease, but in their aggregate character they cannot be misunderstood. We have sufficient grounds for saying that pathological anatomy will furnish considerable resources in reference to Cholera, when properly studied.

We have the same remark to make relative to the alterations observed in cadavera after Cholera Morbus, as we had in reference to the symptoms. It is that these alterations do not always present themselves together, but some are occasionally wanting. The most constant are the presence of serous and viscid matter in the digestive organs, and a remarkable injection of the venous system. The *ramollissement* of the gastro-intestinal mucous membrane is scarcely less frequent.

The redness of the digestive organs is much more common than has been supposed by certain individuals, who have not had the advantage of inspecting the documents, which we have submitted to the reader. We have seen that this redness has been mentioned by a number of observers. In truth, several speak of it by designating it under the names of injections, congestions, ramifications, and vascular net-works; but there are but few, who do not add that red, crimson, purple, and brownish red spots have been observed. The majority of them advance that, in a few cases, the inflammatory character of this redness cannot be contested. Several speak of the inflammation as having frequently left unequivocal lesions. It is certain, that those cases have been comparatively rare, in which the mucous membrane of the digestive organs was entirely white, without any redness or injection;

as also those in which the redness could not be mistaken for traces of inflammation, according to the most generally received ideas; and that in the majority of cases, when several points of the gastro-intestinal mucous membrane were remarkably white, the others were manifestly red, and the color of these last sometimes resembled that purple red, which is so strongly characteristic of inflammation. Moreover, the vascular injection, particularly of the intestines, was not general and uniform, as it is when it depends merely on a suspension of the circulatory function.

An alteration of the bladder is frequently met with. It is here that we appreciate the brilliant ideas of Bichât in reference to the analogy of the morbid condition between those organs, which present the same tissues.

The lungs and heart, after death, as also the vessels, are in the same condition as during life, when death has been sudden.

The alterations of the encephalon and spinal marrow have not been constant, they are in harmony with the symptoms.

We should not be surprised that the trisplanchnic should have presented nothing appreciable. Who can say, that he understands exactly the natural state of this organ, so important, but in regard to which observation is silent and reason conjectures, for the want of some precise data founded on experiment?

After having reviewed the symptoms of Cholera Morbus and the alterations which it causes in the cadavera, we are then authorised to demand what is its nature, what its seat; we shall examine these points in the following chapter.

CHAPTER III.

THE NATURE AND SEAT OF CHOLERA MORBUS.

We have heard it remarked that it was unnecessary to inquire into the nature of Cholera Morbus, because nothing is known in reference to the nature of diseases. These few words contain a serious error or trivial truth, according to the manner in which we employ the word *nature* in the science of human diseases. In fine, if by this expression we understand the *intimate essence* of the malady, which makes it intrinsically what it is, it would undoubtedly be useless to make any researches in order to arrive at any positive notions; in this sense, we do not know any thing of the nature, not only of Cholera Morbus in particular, but of diseases in general. We have wisely renounced the research after the essence in order to limit ourselves to the study of beings; and, in consequence of this happy reform, the word nature is employed to designate, not as formerly every thing that was inaccessible to our observation, but only the laws, which preside over the appearance, developement, and mutual influence of all that composes the world. The physician, who properly appreciates all the evil, which supposition and hypothesis have inflicted on the human race, denies nothing that the imagination supposes—he does better, he does not occupy himself with conjecture. He contents himself with studying, by all the resources furnished by his own senses and scientific labors, the diseases and means by which he will be enabled to remedy them. For him, the nature of a disease is nothing more than the modification effected in the organs, which are the seat of it. It is in this point of view that we shall now proceed to examine the seat and nature of Cholera.

A question here presents itself: Is Cholera a humoral disease? Is it due to the blood, or the bile?

Formerly, physicians were naturally enough induced to attribute diseases characterized by evacuations to the matter expelled from the system, because after this the patient frequently recovered. The humors, they observed, were the cause of the disease, for after their expulsion, the disease ceased. It was far from being the case, then as at the present day, that these evacuations were always, or even most commonly, followed by re-establishment; but pre-occupied with the cases in which the patient recovered his

health, they readily found reasons to explain those in which he died or recovered in consequence of other phenomena. At the present day, as the humors are no longer considered as any thing but the product and aliment of the organs, we have ceased to imagine spontaneous alterations in them. We do not neglect to remark the alterations, which they offer during life and after death; but we likewise remember that these alterations do not occur without some positive affection of the organs; and physicians have agreed upon this fact—that the altered humors cannot precipitate, moderate, or trouble the organic movement without affecting the organs themselves. It is useless to insist on this point; we know of no spontaneons alteration of the humors, and if we did, it would be necessary for us to pass from an examination of them to that of the organs on which these altered humors act so as to produce disease and death.

Can the bile be said to produce the phenomena of this disease? J. P. Frank has sufficiently replied to this question, and it will suffice, without doubt, to refer to what he has said in reference to it; we have already presented a summary of his remarks in the first chapter of this work.* In the opinion of this celebrated observer, the superabundant secretion of the bile is an effect and not the cause of the disease. We will add that, if there are cases in which the bile is abundantly evacuated in choleric persons, principally when the disease is sporadic, or when it does not prove very destructive, there are others, and they occur chiefly when the Cholera is extensively epidemic, in which the bile is very rarely observed in the excretions. The proximate cause, therefore, of Cholera Morbus does not reside in the bile.

In vain have certain individuals imagined that Cholera Morbus was due to an alteration in the blood. What motive is there for advancing this proposition? During life, this fluid scarcely flows from the vein, and whether we abstract it from a vessel of this kind, or an artery, it is black and viscid, and is said to be cold. After death, it is found accumulated in the venous system, black, viscid, coagulated, or liquid, according to the cases. These phenomena are to be noted and referred to the previous state of the individual. In a word, during the disease, when it is intense, and it has always been so when death has followed, the circulation is singularly changed; the pulse is small, thready, and insensible; there is, therefore, a coincidence between the cadaveric phenomena and the symptoms; but where is there sufficient reason for ascribing all the other symptoms to this condition of the blood? Does this condi-

* Page 33.

tion exist from the commencement? Does it even precede the invasion? Shall we attribute to it, the vertigo, nausea, and diarrhea, which sometimes precede the attack? Nothing authorizes such a supposition; it is not even probable. Neither will we be authorized in attributing these symptoms to the thickening, viscidity, or if preferred, to the excessive liquidity of the blood, at a time when the circulation is not yet injured, and when the digestive organs and functions already announce an evident lesion. Let us, therefore, remember that the modifications of the blood in Cholera are secondary, and that we must examine farther, in order to find the source of the disease.

It has been supposed that the blood, in consequence of its disoxygenation and for want of decarbonization, could determine the Cholera; this disease would, therefore, be a variety of asphyxia. M. Searle imagines that a mephitic vapor, a miasm, in a word, an impure air is received into the respiratory organs, contaminates the blood by a venomous influence, and acts, in the same way as sedative poisons, on the capillary vessels, depresses or arrests their functions, and consequently those of the entire system.

This explanation is sustained, says M. Searle, by the fact that a diminution is observed in the digestive, circulatory, respiratory, and nervous functions, whence this author believes himself authorized to conclude that the blood is accumulated by simple congestion in the organs, where it is found at a later period on opening the cadavera.

In order to admit this theory, it would be necessary at least to demonstrate that the pains and heat felt in the epigastrium and around the umbilicus, that the violent contractions by which the liquids in the digestive canal are expelled, that the convulsive spasms and tetanic rigidity, as also the pains in the muscles, are incontestible evidences of the debility of the nerves and parietes of the stomach, intestines and muscles. The time is passed when it was indispensable to demonstrate that an excess of sensation was not a sign of insensibility, and that a violent contraction was not a phenomenon of paralysis. All that has been said to refute the absurd theory which made debility the cause of *ataxie* is here perfectly applicable; it will suffice to refer, on this point, to what we have stated in our physiological Pyretology.*

M. Desruelles is of opinion that the essential cause of Cholera Morbus is the presence of a miasm, which penetrates the blood by means of the digestive organs, respiration and cutaneous absorption; that this miasm enters with the blood into the or-

* *Chapitre* vi. page 302, Edit. de 1831.

ganism, vitiating all the fluids derived from the blood, and affecting profoundly the nervous system. We could readily conceive all the advantage to be derived from this source of inexhaustible explanations, if the miasm were any thing else than a pure supposition, if its introduction into the blood were not a second hypothesis, and its different routes a third. M. Desruelles was aware that it was necessary to explain the character of this miasm; but he did not hesitate to advance that it appeared to be of a peculiar nature; as already he had supposed that the fluids, charged with putrified, venomous or azotic matter, were introduced into the circulation of individuals affected even with sporadic Cholera.*

The nature of Cholera Morbus does not consist in an alteration of the blood.

After having referred the production of this disease to the humors, it remained, in order not to include the organs, to imagine an abstract alteration of the vital forces, a diminution of vitality; but, on the one hand, there exist in this affection phenomena of manifest sur-excitation; but, before subjecting them to the virtual cause of the symptoms, which appear to denote *asthénie*, it was at least necessary to demonstrate that they succeeded these symptoms; now, the disease is sometimes ushered in by the latter, and sometimes by the former. Moreover, what does it amount to, to fix the seat of a disease and to make its nature consist in the modification of a force? For the physiologist and practitioner, the power which animates an organ, cannot be isolated except in virtue of an abstraction rejected by the testimony of the senses and correct observation. Why not, therefore, come immediately to the state of the organs? Whence this repugnance for organic matter?

If it be true, of which there is no doubt, that we can understand nothing more in the organs than what we perceive in them, and that consequently, diseases are for us nothing more than organic lesions, must we not search for the nature of the former, in the modifications of the latter?

Here we ask ourselves:—Is Cholera a disease of the vessels, respiratory system, digestive organs, heart, lungs, or nervous system?

The lungs, vessels, or the heart itself, are not primitively affected in Cholera. In truth, in some cases, the smallness of the pulse, the difficulty in respiration, the coldness and bluish color of the skin, appear from the commencement of the disease, and even before the symptoms of the digestive organs; but these cases are not very common. In fine, it is in cases such as these that the symptoms,

* *Précis Physiologique du Cholera Morbus.* Paris, 1831, pp. 47, 55.

which ordinarily characterize the passage of the disease to death, show themselves simultaneously with the phenomena of the latter; these may be viewed as mere exceptions. In order to appreciate them properly, it is necessary to compare them with those cases in which the truly characteristic signs, that is to say, the most constant, those which are usually primitive, and without which the disease cannot receive the name of Cholera, have time to manifest themselves. These cases are the most numerous, even in the general epidemics, which prove so destructive.

It is, moreover, proper to remark that the signs of profound lesion in the circulatory and respiratory systems observed in all acute diseases, when death is at hand, in dangerous fevers, such as typhus, plague, and yellow fever, are sometimes the phenomena of fatality at the commencement of these affections, when they destroy a large number of inhabitants. So far, the idea has not suggested itself to practitioners, of attributing these diseases to a sort of asphyxia, or syncopy, sustaining themselves on facts purely exceptional. In order to commit this error in relation to Cholera, it would have been necessary for the predilection of chimerical theories, and the prejudice which results from superficial observation, to have assumed the place of truth and sound sense.

The Cholera, therefore, is not an asphyxia, nor a syncopy, whatever resemblance it may offer to these two affections before and after death, as regards the state of the respiration, lungs, and right cavities of the heart, as likewise the venous system. The Cholera is not, at least primitively, a disease of the heart or lungs.

In order to consider Cholera as partaking of the nature of syncopy or asphyxia, it would, to a certain degree, be necessary to place its seat in the nervous system; for this always undergoes a serious alteration, either primarily or secondarily, when there is a suspension or abolition of the functions of the heart and lungs. But there were other reasons for considering Cholera Morbus a disease of the nervous system; the suddenness of its attack, the rapid progress of the disease, the numerous nervous symptoms characterizing it in the majority of cases; the nervous character of the symptoms appertaining so frequently to other organs, or at least manifesting themselves in other parts than the nervous system itself; the appearance of symptoms really nervous at the commencement of the disease, and even before any others in certain instances; the absence of pain in some subjects, its diminution on pressure in others; the absence of any evidences of inflammation, when the disease had continued but a short time; a still more manifest absence of inflammatory phenomena in those cases in which it terminated by a speedy return to health;

a few morbid traces of little value in different parts of the nervous system; and some others announcing a diseased state of this system, all tended to the belief that the nervous system was the seat of Cholera Morbus.

In fine, the nerves are far from being unconnected with this disease. If no morbid traces are observed in the *trisplanchnic;* if they are not very evident in the encephalon, although the remarkable sanguineous injection observed in this viscus is not an indifferent circumstance; if the spinal marrow has been rarely found to be the seat of serious alterations, without doubt because it has been but seldom examined—and this is proved by the fact that injections, and a remarkable redness have been observed in it, when it was closely inspected—in a word, if pathological anatomy has scarcely discovered any thing but the accumulation of blood in the cerebro-spinal system, the attentive and repeated observation of the symptoms has proved that this system is dangerously affected in Cholera Morbus.

But is it primarily affected, and in what manner?

Before solving these questions, let us examine how far the digestive system is interested in this disease.

During life, there is a sensation of weight, embarrassment, heat and pain in the epigastrium, and soon afterwards around the umbilicus; loathing of food, diarrhea, nausea, excessive thirst, dejections, repeated and violent vomiting, which soon ceases and is accompanied by feeble nervous symptoms, or increases so that the digestive tube is, as it were, twisted, and depressed in all directions; very abundant evacuations at the same time, and afterwards debility or convulsive action of the muscles; sometimes developement of pain, increased by pressure on the abdomen; appearance of symptoms of gastritis, enteritis, gastro-enteritis, with or without prostration. After death, there are most frequently, if not evident redness, at least injections, not in the whole extent of the digestive tube, but on different points of this canal, and always more apparent than the lesions of other organs; and when the disease has attained its greatest degree of intensity, when it proves fatal to the greatest number of those it has attacked, a viscid and serous matter is observed in the stomach and intestines, sufficient not to confound this disease with any other.

Such are the phenomena, which clearly indicate the important influence exerted by this malady over the digestive organs.

We may even say more:—the gastro-intestinal tube is the principal seat of the Cholera. Antiquity never doubted it, antiquity that never had the advantage of autopsical examinations. Can we deny that such, in fact, is the principal seat of this dis-

ease, we who possess so many brilliant works of the English and of our own countrymen—from which it results, as M. Christie has observed, that the invariable morbid phenomena of Cholera are limited to the mucous system, whilst those of the other systems are only occasional?

All that has been advanced to establish the fact that the phenomena of gastro-ataxic fever are due to the lesion of the digestive organs, is very applicable at this time. This opinion is even less doubtful; for, in these fevers, the gastric symptoms are less characterised and constant than in Cholera. We shall not, therefore, compare this to the ataxic fevers unattended by gastric phenomena, except in some rare cases in which the nervous symptoms themselves appear to assume the character of Cholera.

The knowledge of the nature and seat of the epidemic when Cholera prevails with this character, and in all cases in which the gastric symptoms are wanting, pathological anatomy demonstrates that the digestive organs have been the principal seat of the disease.

In attributing the lesion of the nervous system to that of the digestive organs, we do not wish to depreciate the first, nor deny that it may sometimes be primitive. It is even probable that, in the course of the epidemics of Cholera Morbus, there is scarcely any lesion observed but that of the nervous system, in certain individuals who have died suddenly; this system having alone experienced, at least in a powerful manner, the influence of the causes of this disease—causes of which farther mention will be made in the following chapter.

If it be asked, what are the organs affected in Cholera Morbus, we must reply that they are successively, first the digestive organs, and then, the nervous system, heart, lungs and vessels.

The effects experienced by the skin in Cholera Morbus are likewise deserving of attention. When the disease commences, they are altogether secondary; but we cannot doubt that, in many cases, the imperceptible modifications, which this tissue has undergone before the developement of the morbid phenomena in the digestive organs, have contributed to determine the affection of these last. Perhaps, the same thing occurs in the mucous membrane of the bronchiæ. We might say as much in relation to the changes which the nervous system undergoes in the different moral affections. But all this will be treated of, when we consider the causes of Cholera Morbus and their action on the organism.

It remains to determine in what manner the digestive organs are affected in Cholera; or in other words, whether this disease

is a simple neurosis, catarrh, secretory or gastro-intestinal irritation.

In the first place, all that we have said of Cholera, considered as a nervous affection in general, applies to this disease regarded as a nervous affection of the digestive organs. If it be true,—if it is undoubted, that a lesion characterized by an abundant secretion cannot be attributed alone to the modification of the nerves, it is evident that a disease in which the sensibility is exalted and the action increased, necessarily affects the nerves. Consequently, there is neurosis in Cholera, if by neurosis we understand that the nerves of the digestive tube participate in the morbid affection ; but there is more than a simple neurosis. There is no doubt that this neurosis is stenic, that it consists in a lively irritation of the gastro-intestinal nervous system.

Since it is not possible to deny that the vessels are affected in Cholera (and this we cannot do when we reflect on the symptoms and lesions found in the cadavera) it is asked how do they become so.

Is there catarrh ? If by this word we understand an excess of mucous or sero-mucous secretion, having its seat in a mucous membrane, there is catarrh in Cholera. But if by catarrh we understand a peculiar disease, unconnected with the inflammation, and whcih does not merit the name of irritation, or which even results from a debility of the tissue which it occupies, there is not catarrh in Cholera, for this disease is very similar to others, particularly poisoning by irritants, in which the inflammatory character is manifest ; there is irritation, because there is heat ; there is no debility, for the sub-adjacent muscular membrane expels with astonishing energy the super-abundant matter.

In admitting, therefore, that a gastro-intestinal nervous irritation exists in Cholera, as there does in every affection in which the symptoms of irritation manifest themselves so strikingly, we must also admit a vasculer secretory irritation having the same seat.

In the very few cases in which evacuations do not occur, and where death ensues almost immediately, the nervous irritation alone is apparently developed, and is sufficient, in acting on the rest of the organism, to determine the cessation of life. There are analogous cases, without being identical, in which there are but slight vomiting and dejections, although all the other symptoms are very evident. But we must not be deceived, if, in certain cases, the irritation extends somewhat farther than the gastro-intestinal nervous system ; in others, on the contrary, the inflammation itself arrests the evacuations.

When we reflect attentively on the symptoms of Cholera, and the traces it leaves in the cadavera, as also on the analogy of both of these with what is observed before and during death in similar diseases, we must be convinced that the Cholera is not always a phlegmasia as was imagined, before the progress of pathological anatomy had strengthened the testimony furnished by the extraordinary rapidity of the Cholera in a number of cases.

In a word, vomiting can be produced of itself, not only by every thing which irritates the stomach, but by any irritation imparted to any of the mucous, dermoid, or parenchymatous tissues; from the same circumstances, though less easily, diarrhœa may result. Their re-union, therefore, cannot be given as proof of the existence of inflammation. It should be recollected that the rapid progress of Cholera, the frequent absence of that *accroissement* so characteristic of pain when pressure is made on the abdomen, is an argument in favor of those who deny the presence of inflammation; we must also admit that sometimes the mucous membrane of the stomach, and even of the intestines, will be found free from redness on opening the body. We are, therefore, permitted to doubt whether inflammation exists in a similar case; we cannot deny, however, that there is a very acute irritation of the nerves and vessels, and certainly of the gastro-intestinal mucous membrane—an irritation bordering on inflammation, frequently ending in it, and thus becoming still more dangerous.

It must be acknowledged that there are cases in which the gastro-intestinal inflammation may be mistaken; and such cases require serious attention, if we wish to avoid grave errors in practice. It is the duty of the practitioner to distinguish these different circumstances.

However, he will commit a fatal error if, in attending to the digestive organs, he neglects all the others. The heart which languishes, the abdomen which can scarcely perform its functions any longer, the brain and spinal marrow, all these organs oppressed by the blood, which flows towards them from the circumference, under the influence of the pain and irritation of the membrane of the digestive organs, merits attention. There is not only an irritation in these viscera, there is also a superabundance of blood to which we should attend. We are not to forget that, in Cholera, a violent action takes place from the circumference, and that this *refoulement* is of no utility; consequently it should be combatted.

There is a certain variety of Cholera which is arrested at this first period, short and rapid, in which there is no nervous irritation; in others the vascular or rather the secretory irritation is very evident. Sometimes it is limited to the expulsion of undigested aliments and drinks; sometimes it even determines the

evacuation of bile; finally, either after the evacuation of the bile, or when this fluid has not appeared, it expels copious mucosities, or an abundant serous liquid.

In these different varieties of Cholera, we may suppose that the irritation does not extend, in the same degree, to the biliary organs. Thus, when the aliments alone are evacuated without any remarkable mixture of bile, the liver, the biliary ducts, and vesicle experience apparently but a feeble irritation which is not sufficient to excite in the ducts and biliary vesicle the necessary contractions to throw this liquid into the digestive organs; or, if you choose, the orifice of these ducts contracts in consequence of the irritation of the mucous membrane, and opposes in this way the flow of bile. We cannot determine exactly in which way things pass, and in this respect we can only indulge in suppositions, which has too frequently been the case. When the serous or mucous liquid flows abundantly, it is imagined that the vesicle, though full of bile, cannot disgorge itself of the fluid it contains, for want of contraction, or because the orifice contracts instead of dilating.

It may also be said that, the bile being brought into the digestive passages, by a moderate degree of irritation, analogous to the digestive excitement, it ceases to flow into the duodenum, when this is undergoing violent contractions, and consequently in a state entirely opposed to that of digestion. No matter in what manner this may take place, the biliary organs participate secondarily in the morbid condition of the stomach and small intestines.

The vacuity of the bladder and suspension of the urinary secretion, which will not be doubted, should, *à fortiori*, be considered as secondary effects of the state of the circulation in particular, and of the digestive organs in general.

In the greater part of acute, dangerous, epidemic diseases, the urine becomes suppressed: so also in typhus and yellow fever.

The irritation of the digestive organs does not limit itself in provoking vomiting and alvine dejections, hastening or retaining the bilious excretion, or soliciting an abundant discharge of mucus and serosity; it sometimes even produces an inflammation, which frequently assumes the external form of spasm, convulsions or stupor, a state corresponding with a primitive affection of the encephalon and spinal marrow. In a word, Cholera is an irritation at first nervous, then secretory, and sometimes inflammatory, of the stomach and intestines, particularly the large, characterized by abundant and repeated evacuations above and below, in the course of which the circulatory and respiratory systems become gorged with black blood in their venous portion, as also the encephalon and spinal marrow.

According to the degree at which Cholera is arrested or attains,

according to the nature of the secreted substances, or the absence of any one of them ; in fine, according to the particular sympathetic or nervous symptoms that predominate we may distinguish it into alimentary, nervous, inflammatory, bilious, mucous, serous, tetanic, convulsive, or typhoid.

We again state that these are not peculiar species of Cholera, but merely degrees of intensity, either in certain parts of the diseased organ, in its whole texture, or in such or such organs as may sympathize with it.

We can conceive that the progress of the symptoms may be so rapid that the sanguineous engorgement of the general venous system may occur, and the circulatory movement be arrested so as not to be revived, from the commencement of the attack ; this at least takes place in a few cases. The Cholera then appears to be confounded with asphyxia, but it can never be mistaken, if we judge it according to the character of the prevailing epidemic, and if, on opening the body, besides the degrees of congestion, we observe, in the digestive organs, viscid and serous matter ; this together with the redness, injections, and even the remarkable whiteness of the mucous membrane, will afford us abundant materials for a correct diagnosis in reference to Cholera Morbus.

The vain desire of conciliating opposite opinions has not induced me to adopt the theory just mentioned ; I have merely followed the consequences, which necessarily result from a comparison of the symptoms and cadaveric phenomena, regard being had to the progress and different terminations of the disease.

We can now understand why this affection has sometimes been considered a neurosis, a phlegmasia, an *asthènie*, and sometimes an asphyxia, because certain practitioners have merely regarded one particular symptom, and others have been satisfied with the contemplation of some other ; pathological anatomy even, interpreted abstractedly, gives but an imperfect explanation. However, but one thing was necessary in order to extract truth from so many useful labors—it was to give them proper consideration.

For a long time, authors have spoken of a prostration, a profound lesion, a debility of the nervous system, as constituting the most formidable element of Cholera Morbus. Indeed, this system appears to be subjected to something analogous to this, since death is so prompt in cases in which the disease rapidly gets beyond the control of art, and especially in cases of sudden death ; but this exhaustion of nervous power is as much the effect of the gastro-intestinal distress, and of the considerable loss of matter by evacuation, as of any other action, which could have been previously exercised upon the nervous system.

Some physicians are of opinion that Cholera is a nervous inflammation; that it consists essentially in an inflammation of the nerves of the bas-ventre. In consequence of the extremely rapid march which Cholera presents, the entire solar plexus and nerves with which it communicates are attacked with an inflammation of their substance; their action is suddenly paralysed, and this paralysis soon increases; the patient dies instantaneously or in a few hours. This species is termed central medullary *ganglionite.* In the mildest form of Cholera, these nerves are inflamed at their periphery, it is then a *ganglionite néurilématic périphérique.* Epidemic Cholera is a mixture of these two species of ganglionic inflammation. The hepatic plexus is attacked by the central ganglionite; the other nerves by the peripheric ganglionite. These are the nerves, which occasion the most intense evacuations, vomiting, cramps, and other severe symptoms.

In the latter period of the disease, when these accidents frequently cease altogether, the central ganglionite also attacks these nerves. The blood which the vena portæ carries to the liver can no longer be employed for the preparation of the bile, and it is conducted in all its carbonic nature to the right ventricle of the heart and to the lungs; in this way the enormous quantity of blood is formed, which strikes the eye of the observer.* This theory, altogether imaginary, and deduced from hazarded physiological applications, will merit attention when observation shall have deposed something more in its favor.

The nature and seat of intermittent Cholera Morbus differs only in relation to the period, seat and nature of continued Cholera. Perhaps, in the first, the lesions of the digestive organs are less evident than in the second; but probably the encephalic affection is more strongly characterized.

The Cholera from poisoning could furnish us with numerous arguments in favor of our opinion in relation to the seat and nature of this disease, when it is due to another cause; but in the Cholera, produced by poisons, the evidences of inflammation are much more marked in the digestive organs: here, at least, there is no doubt; unless in a very few cases in which arsenic has been found in the stomach, without any lesion being observed in the parietes of this viscus.

What we have just said respecting the nature, seat, and different varieties of Cholera Morbus, requires to be confirmed by the study of the causes; this will be the subject of the following chapter.

* M. G. Weyland, *Traitè sur le Cholèra Asiatique*, p. 54.

CHAPTER IV.

CAUSES OF CHOLERA MORBUS.

Every day we hear the question, What is the cause of Cholera Morbus; and this is not surprising on the part of those persons who are strangers to the practice of our art; but when it comes from professional men, we cannot but be astonished. There are very few diseases to which we can assign any particular cause. In diseases, as under other circumstances, it is rare that an effect recognises but one cause only; and this is the more readily conceived, as there is nothing isolated in the organism, more than in nature generally. Let us, therefore, examine what are the *causes*, and not what is the cause of Cholera Morbus. A disease may be produced suddenly by one or more accidental causes, the intensity or re-union of which exercises such an influence over the organism that, notwithstanding the previous healthy state of this latter, the disease declares itself suddenly; in this case, the origin of the affection is easily determined, and there is no controversy in regard to it. The same disease may be occasioned by a series of circumstances whose influence becomes successively more evident, or by a circumstance the continuance or frequent repetition of which becomes stronger and stronger every day. The succession, connection, continuance, and repetition of these circumstances may escape observation, without on this account being less efficient; hence the number of sterile discussions on the causes of epidemics, and the general tendency to attribute them to occult, unknown, and specific causes. In every thing, curiosity and fear have sanctioned ignorance.

The causes of Cholera have been indicated by Hippocrates,* Cœlius Aurelianus,† Alexander of Tralles,‡ Bontius,‖ Sydenham,§ Hoffman,¶ Quarin,** and I. P. Frank,††. Let us now repeat them in order to ascertain their particular action.

The excess at table, abuse of indigestible viands, crustacea, leeks, onions, lettuce, cabbage, pastry, greasy, oily aliments, fruits, cucumbers, melons, farinacious substances, warm water, wine mixed with milk, old aromatic wine, acrid purgatives and emetics, irritating, acrid, corrosive, vegetable poisons, acids, and minerals;

* Page 11 of this work. † Page 17. ‡ Page 19.
‖ Page 23. § Page 24. ¶ Page 28.
** Page 29, †† Page 32.

the sojourn on board of a vessel at sea; anger and solitude; heat of summer, particularly towards the end of the season; the humidity of autumn at its commencement; the winter season; cold nights succeeding hot days; youth and vigor.

If we take a rapid survey of these different conditions, we will perceive that some of them affect the digestive organs; such as the abuse of nourishing aliments and stimulating drinks, greasy, aqueous, acrid, acid, solid, farinacious food, the use of warm water, irritating evacuants, and poisons; others affect the nervous system, and afterwards the digestive organs—the tossing of the vessel and anger; others, the skin, then the digestive organs—heat, humidity, cold and their viscissitudes; in fine, all these circumstances exert a more evident influence on young and vigorous subjects.

The action, therefore, of the causes of Cholera Morbus described before the epidemic, whose progress now fixes public attention, affected primitively or secondarily the organs of digestion.

What have been the causes of the Cholera in India?

Young, healthy, and vigorous persons, observed Mr. W. Scott, are not so liable to the Indian Cholera. It is supposed that women are more subject to it than men. Children are disposed to it; but those at the breast do not contract it. Those individuals who have recovered from sickness, and such as are yet indisposed, are very liable to be attacked by Cholera. It has been known to appear in the midst of a mercurial treatment, and in pregnant women. One attack of Cholera appears to predispose to a second. The poor and laboring classes are more particularly affected by it. Errors in regimen, sudden changes in our mode of living, variations of the atmosphere, the action of certain medicaments, fatigue, dangers, and oppression of the mind, have been mentioned as remote and exciting causes of Cholera. Several cases of this disease have been mentioned as having been produced by the use of purgative salts. M. Orton is of opinion that the diminution of atmospheric electricity is the immediate cause of Cholera. The same author attributes considerable influence to the sun and moon. Some have imagined that deleterious exhalations were emitted from the earth. M. Tytler states that the muddy rice of the swamps, constituted the sole cause of Cholera at Bengal.*

M. Gravier attributes the Indian Cholera to the cold and humidity so frequently occasioned by the north winds, and which exert a powerful influence over the poor Malabarians, badly lodged and nourished, passing the night on the ground, on damp mats, or under open sheds in which the cold is keenly felt, especially dur-

* W. Scott, *Treatise on Cholera*, translated by Brin, pages 133, et seq.

ing the rains determined by the north winds. He likewise assigns a remarkable influence to the excessive heat of the days, followed in the night by cold and moisture. In addition to these, low houses, wanting proper ventilation, and where the sun does not penetrate; and in fine large collections of people will tend to the production of the disease.

Placed under a burning sun, says M. Deville, in the midst of the excessive heat of summer, eating nothing but rice, and drinking the bad water of the Ganges, sleeping in filth, and for the most part of the time in the open air, the Indian of the poorer class especially is more exposed than any one else to the ravages of Cholera. The bad quality of the food, the great quantity of water taken on account of the heat, and particularly the sudden change of atmosphere, the heat of summer having immediately succeeded the winter or the cold and damp season, may likewise be considered as causes of this epidemic. The workmen and such as were most exposed to the heat of the sun, were the first attacked by it.

The mode of life adopted by the Indians and Orientalists, says M. Keraudren, is of such a nature as to contribute to the production of Cholera. The first abstain constantly from the flesh of animals; some of them however, occasionally eat fish. Their food is essentially composed of vegetables and fruit which have not attained their maturity. Dry rice is the basis of their nourishment; they almost always add to this a kari of plants more or less cold. They collect the flowers, stalks, and roots of several species of nymphœa; and the heart, flowers, and green fruits of the banana tree. They make but one or two repasts each day, and as their dishes are not very nourishing, they take them in great quantities. It is true that their food is ordinarily seasoned with a considerable portion of pepper and aromatics, which correct, to a certain extent, the cold quality of the vegetables of which their meals are composed; but the too frequent use of these acrid and heating substances tends to stimulate and irritate the mucous membrane of the stomach. Water is the only drink of the Bengalians, and particularly that of the Ganges, when they can procure it, although it is always filled with mud. The Europeans have been affected with Cholera in much less number; some live with the natives and imitate their habits; others, using every thing in moderation, observe in some sort a mixed regimen, and these nearly all escape. The Indians are in general badly clothed and lodged, and almost always sleep upon the ground. Their bodies, relaxed by the heat, are more exposed to the serious disorders occasioned by the sudden chilling of the skin. Thus the impres-

sion of cold, whether it be produced by a low temperature, deficiency of clothing, or an open habitation; indigestible, acrid aliments; raw and unripe vegetables; the use of pure and cold water in drink and baths; venereal excesses, and exposure to the cold and damp night air, by exciting a primitive spasm of the skin, and affecting the digestive organs, have been causes of this fatal epidemic.

In a word, excessive heat, marshy exhalations, a particular alteration of the atmosphere, great humidity, the electric fluid in greater or less abundance, filth of houses and cities, crowded population, bad quality of the rice, and venomous exhalations have been ranked among the causes of Cholera.

Whilst certain observers have endeavored to prove that the same causes, which determine sporadic Cholera, likewise produce, or at least favor the developement of epidemic Cholera, and others, to assign singular and new causes to it, many authors, among whom there are some strangers to our profession, have denied every kind of influence to the earth, atmosphere, regimen, constitution, age, sex, class, race, not only in the production, but even in the appearance of Cholera Morbus. Thus, so many morbid causes surrounding the unfortunate persons whom Cholera had destroyed, were without action in the eyes of these self-constituted judges.

Their principal argument is this: you pretend that the heat which prevailed in such a place, at such a period, favored the developement of Cholera: now, it was cold in another place, and at another period, and the disease still prevailed; satisfied with having thus attacked one point of the problem, they neglected all the others, and imagined that they had found the desired solution. Do not believe that this solution consists in one fact; it is reduced to a negative and affirmative, the first contesting facts, the other establishing an hypothesis; thus, they say the appreciable causes assigned to epidemic Cholera not having produced it, it is to be attributed to an occult, special, unknown cause which is the only real one.

This is something at least curious, if not very evident—a real and unknown cause. But when it has been proved that the causes assigned to Cholera have not exerted any influence over its developement, origin, and propagation, what can be rigorously concluded from it. Nothing, except that its cause or causes were unknown. We should deplore this sad deficiency in our science, and not imagine that we have remedied it, by deciding that Cholera is due to a cause at once real and unknown.

But no one will say that the excessive heat, the cold succeeding to heat, the humidity joined to heat or cold, bad regimen, fear, sadness, fatigue, excesses of every kind, are without any influence in the production of a disease which destroys a number of persons, when it is averred that it is frequently developed, if not always, after one of these circumstances, particularly after those which relate to regimen. Even when we admit a more powerful cause, unknown, but real, as is said, it is reasonable to admit that the action of the unknown is at least fortified, and favored by the action of the known cause. Do you wish a striking proof of it? In order to demonstrate that heat does produce the Cholera, it is stated that it prevailed at Moscow towards the end of last November, when the ground was covered with ice, and that the thermometer was sixteen degrees below zero; but in fine, urged by a feeling of truth, they made an ingenious solution of this fact. This persistance of the Cholera during the cold season, say they, is a phenomenon without example, and that consequently it must be attributed to the influence of some local cause, and they are inclined to ascribe it to the use of the immense stoves, which maintained, in the interior of the Russian houses, an extremely elevated heat. But, instead of concluding from this real fact that the Cholera originated in consequence of the influence of this artificial heat on the organism, and of the sudden transition of heat within to cold without, they imagine that the germ of the disease may develope itself, and that in fact it does develope itself under the influence of the artificial heat. Now, behold the real and unknown cause of Cholera, singularly compared to an egg, which is made to hatch by an industrious incubation.

A theory like this deserves to be placed by the side of that of Doctor Hahnemann and of many others, who attribute Cholera Morbus to an imperceptible animalculus, which attaches itself to the skin, hair, and other parts of the body, and to the clothes, and thus transmits itself from one individual to another.*

That there are, in the production of epidemic Cholera, conditions which escape, either our limited means of observation, or our want of perserverance or method in observing, we can reasonably admit, not only for this epidemic, but for all those which have preceded it, no matter what might have been their nature; and even for all diseases, for there is not one, which does not present some impenetrable mystery. Four persons are exposed to the rain; one only escapes uninjured; a second is affected with ophthalmia; a third with bronchitis; the last with diarrhea.

* Weyland, *Traite de Cholera Morbus;* page 59.

We are reduced to the necessity of saying that each individual has the predisposition to the disease, which declares itself. In what does this predisposition consist? We may say to a certain degree what has given rise to it, but we do not know in what it consists.

Because mere presumption appears to militate in favor of unknown causes of production, should we consider as useless the knowledge of circumstances, whose influence is manifest? Is there not great advantage in understanding these in order to prevent or control their action? On the contrary, what will be gained in the supposition of that which we cannot appreciate? What views of hygiene are to follow this hypothesis? What practical indication are we to derive from it?

We may, therefore, suppose all that we wish, in reference to the unknown cause of Cholera, and we shall gain nothing in regard to the origin, cause, prevention or limitation of this disease.

Let us abandon these inconsistent notions, and repose upon problems of much greater importance, and calculated to fix the attention, because they apply directly to the practice. Is the Cholera Morbus transmitted from one individual affected by it to another in full health? Can this transmission be affected by clothes and merchandize? Is the Cholera an importable disease? In a word, is it contagious? Such are the questions which will now occupy us.

CHAPTER V.

IS CHOLERA MORBUS CONTAGIOUS?

This question has been answered in the affirmative without hesitation, and it is sustained on the authority of four consuls, eight physicians, the English Ambassador at St. Petersburgh, the Minister for the interior of Russia, his Majesty Nicholas, the Generalissimo of Poland, Skrzynecki, and distinguished personages whose scientific or social position has, it is urged, invested them with the power of acquiring either directly or indirectly a certainty of the contagious character of Cholera Morbus.

But power can be invoked with justice only for political or administrative matters placed by fundamental laws within its reach; and even then it is subject to control. Science has authority only as long as it demonstrates its conformity with observation. Industry has a competent voice only in questions of gain and production. Let us, therefore, lose sight of the names, and examine the facts, or at least what are called such.

The Cholera, it is said, is transmitted by maritime communications, for it has been carried in this way to the Isle of France, Bourbon, Panwell, in the isle of Ceylon, Achem, in the isle of Sumatra, Penang and Singapore, Bankok, Canton, Macao, Java and Manilla, the isles of Ormus and Kishmé, Mascata, Bahreim, Bassorat, Benderh-Aboushi, Astrakan, Nicolaïeff, Kertz, Sébastopol, and Odessa; and by the barks of the Volga, to the cities situated on the two banks of this river.

The Cholera, it is said, is transmitted by means of caravans, for it was carried in this way to Moussol, Merdine, Diarbekir, Orfa, Biri, Antab and Alep; to Schiraz, Yerd, Ispahan, Koms, Carbin, Tauris; and finally to Orenbourg.

The Cholera, they say, is transmitted by army bodies; for troops introduced it on the route from Nagpore to Madras; not far from Delhi, the troops communicated it to others whom they met on the road; a detachment introduced it into the camp of Terayt; a company was affected by it shortly after arriving at Trichinopoly, and the garrison soon contracted it; a regiment, affected with Cholera, on its way to Gooty, communicated it to the villages through which it passed, and which until then had been exempt from it; it appeared at Aurengabad and Melligaum after the arrival of the troops that had left the city of Jaulnah, where this disease prevailed; at Secundrabad, after the arrival of

a detachment that had suffered from it on the road; every where the marching troops, arriving at places in which the disease prevailed, were attacked by it in one or two days; and these same bodies, a prey to this scourge, arriving in cities and villages in which the public health was perfect, immediately communicated the Cholera to the inhabitants and troops. In fine, it is said, the Cholera was brought by the troops into Podolia, Volhynia and Poland.

The Cholera, it is also said, is transmissible by troops of pilgrims and deserters, and ravages of this disease are cited after the pilgrimages from Hindostan, a public exorcism at Siam, a feat at Benares, and a meeting in a village near Bourhampore.

The Cholera, it is said, is transmitted by individuals; for it was carried to Bombay by a traveller; to the isle of Salsette, by a detachment conducting a prisoner; to the camp, at Gorrouckpore, by a *cipaye;* to Saint-Thomas-du-Mont, by an European; to Moscow, by a student; to Katschalinskaya, by a Cossack, and to Kazan, by an individual from Nigni-Novogorod.

It is said, that the French consuls at Algiers and Tripoli, several inhabitants of the isle of France, the vessels at anchor off Manilla, different villages in the isle of Bombay, the inhabitants of the prison at Allore, the neighbourhood of Saint-Denis at Bourbon, and the city of Sarepta were preserved from Cholera, by seclusion.

It has resulted from all these facts, thus presented, that the bureaux of Calcutta and Bombay, the medical council of St. Petersburgh, the council of the admiralty in Great Britain, the central sanatory committee of France, the superior council of health of the same country, the private council of England, the Ottoman, Prussian, Saxon, and Austrian Governments have adopted the opinion that the Cholera is contagious, and ordered or advised measures to be taken in consequence of this assumption.

Do these facts prove what they appear to prove? And in the first place are they facts of veritable transmission? Persons set out with the principle that Cholera is transmissible, then they inquire into the manner of this transmission, and they prove this second assertion by stating that it was so at such a period, and such a place. The general assertion is sustained only by assertions in detail: where are the evidences of these last? They are the affirmation of a consul, and of one or more physicians. Certainly, this would be sufficient testimony if we were speaking of a case falling under our senses, but such is not the fact. We are now treating of a matter, over which the senses have no immediate control, and which can only be arrived at by a logical

deduction. Now, this deduction is reduced to the following: The Cholera did not prevail in such an isle, such a city, such a camp, such a village; and behold it manifests itself there after the arrival of a ship, a caravan, a company of troops, pilgrims, or isolated individuals, coming from a place in which the Cholera reigned, and who were themselves affected by it. This is not a case of the nature of those, which the testimony of one or more persons may demonstrate in a satisfactory manner; for, he who reads the description of it knows neither more nor less, in reference to the supposed transmission of the disease, then he who reports it either as a remote or occular witness. In a word, the latter has seen the ship, the caravan, the detachment, the individual or he has heard them spoken of; after this he has seen the patient affected with Cholera, and in his imagination the whole is connected by a hypothetical chain, on which observation has no direct hold.

If there were sufficient motives to admit the *possibility* of the transmission of Cholera, in the recitals of which we have just given a summary, there certainly are none which would authorise us to believe firmly in the transmission of this disease.

Moreover, we should not proceed with such little method as to give a secondary fact all the importance of a primary one. You wish to prove the transmission, and in the commencement you endeavor to demonstrate the importation of Cholera; it would at least be necessary in the first place, to prove directly that this disease could pass from one individual to another. This has been entirely neglected, as if it were unimportant. One page has sufficed for this difficult object.

" An individual arrived at Saint-Thomas' from Madras, affected with Cholera, which he had contracted on his passage, and died; the next day, his wife died; two days afterwards, the proprietor of the house; two days after, the wife of the proprietor, and the domestics who attended on them.

" When the disease appeared in a street, say they, it entered all the houses; and, when it proved fatal in a family, it affected all the members one after the other; those who assisted the patients were attacked during or after their attendance.

" In the hospitals, the men, attacked with other diseases, promptly contracted the Cholera, particularly if they lay near those affected with it.

" The domestics who served their masters, affected with the disease, frequently contracted it themselves.

" Physicians, all the persons engaged in the service of health, were particularly exposed to it.

" In India, the only one of all the Europeans, who, during a fatal irruption among the natives, caught the disease, was the physician from whom they had received medical attendance."

All these assertions have been contested, and controverted in different ways.

Instead of reasoning on them, so decisive in appearance, let us listen to other witnesses.

M. Zoubkoff, chief-adjunct in a quarter of Moscow, in examining the book in which he inscribed daily the names of all the persons affected with Cholera, remarked that the greatest number were found in that portion of the quarter situated on the borders of the Moskwa and Canal, and where there was no pavement. In some houses there were five patients. One house, in which there were three, was composed of two *corps-de-logis* in stone, the front of which regarded the marsh, and the side of the one the canal; the yard was paved, but it was much lower than the street, and even lower than the cellar, and very muddy; the number of lodgers was sixty; there were in the house a restaurant, a furnished chamber, and different artizans. The patients affected with Cholera inhabited the *corps-de-logis* one of the sides of which regarded the canal; in general, all the rooms, except those occupied by the restaurant, were very dirty. While the patients inhabited them, no one avoided approaching or even touching them. After the sick had been transported to the hospital, the rooms were merely perfumed with ginger.

There were five patients affected with Cholera in a manufactory of cloth; the side of the house was composed of stone, on the border of the Moskwa; the yard was lower than the street, unpaved and very muddy. There were about seventy workmen; they were lodged with their wives and children in large chambers divided by partitions into cells. The air in them was very bad. The chamber in which there had been two patients was locked; and since their admission to the hospital, no one had entered it; the same thing was done in the house in which there were three, as in the one which we have just mentioned. Six patients left two houses; one, composed of stone, on the border of the canal, opposite to the marsh, the yard of which, was unpaved, and very dirty. The other was composed of stone and on the canal; its yard was partially paved, and the lodging rooms narrow and dirty.

There were two patients in a hotel; it is situated in a street near the canal; the yard was tolerably clean, and the apartments narrow; the ground floor was divided by a long corridor, on each side of which there were apartments to let; the air was very bad.

In all these houses, the persons who had lived with the patients

were not afraid to approach or attend them without taking any precautions. After the patients had been transported to the hospital, their apartments were fumigated with ginger only. All the boarders who remained were unaffected, and there was no reason to believe that the sick had taken the Cholera from others.

Before 11th of October, M. Zoubkoff had occasion to observe two interesting cases. A man died with Cholera; the chamber which he had occupied had been locked, but not cleansed; and it was separated from the others only by partitions which did not reach to the ceiling: consequently, the air charged with the miasmata, not meeting with any obstacle, mingled itself with that of the other chambers inhabited by several individuals in good health. Having one day visited a room in which a female had been sick with the Cholera, he observed that the chamber which she had occupied had not been fumigated; the owner entered it several times; the patient's pillow had not been taken away, it was in an adjoining closet covered with the matter ejected from the stomach, and yet humid. In this narrow closet, about a foot distant from the pillow, there was a bench with a mattress, on which the servant of the proprietor had passed the night; the latter, all his family, and the servant were in perfect health.

Since the 5th October, M. Zoubkoff visited the hospital every day; he remaked with astonishment that all the assistants in the wards, all the soldiers, touched the patients, supported their heads whilst they vomited, placed them in the bathing tub, and removed the dead without taking any precaution, and always without contracting the Cholera. Deynert, the surgeon's aid, particularly distinguished himself by his intrepidity; he passed the day and night in the wards of the sick, and not limiting himself to his own duties, he even assisted in the discharge of those peculiar to the infirmarians and soldiers, without using any precaution. In the presence of M. Zoubkoff, he administered a potion to a young girl, in an attitude which approximated his mouth so near that of the patient's, that he could not avoid inspiring her breath. This girl died a few moments afterwards, or even while she was taking the potion. Deynert did not fall sick.

The patients were removed in a carriage, and always accompanied by a soldier. It required sometimes half an hour to transfer the patients to the hospital, and, consequently, the soldier respired every day, for several hours, the air emitted by the sick. The clothes of M. Zoubkoff touched the bed covering of the sick and dying; his cloak was frequently taken off by the same soldiers, who, without using any kind of precaution,

removed or raised the patients, and those who had died; they sometimes placed it near them in the antichamber. The infirmarians and Deynert touched it, and did not contract the Cholera. In those wards in which the patients were threatened with approaching death, he washed his face and hands with the chloride of lime, and breathed through a sponge moistened with vinegar; but, in the other wards, and in those of the convalescents, he did not employ these precautions; he sat on the beds of the sick, conversed with them, and endeavored to encourage them.

Deynert, who attended the sick with so much intrepidity, was not affected with the Cholera. Another surgeon's aid, who approached the patients with great repugnance, and being intemperate, was attacked with Cholera, and died during the night.

A new hospital having been established, M. Zoubkoff, made a series of observations and experiments, which confirmed the conviction that Cholera was neither a contagious disease, nor a miasmatic epidemic. Doctor Mavroyany, and the students Emelianoff and Istotchnikoff, attached to this hospital, after having been stationed in another quarter of the city, entertained this opinion, and cited facts in support of it. A peasant affected with Cholera was brought to the hospital; he was put into a bath in which some bran had been placed; they themselves put him into the bath, covered his shoulders with this bran, and renewed it when it became cold; M. Emelianoff bled him; he made frictions on the vein, and his hands were for some minutes covered with the blood of the patient. They applied their hands several times on the different parts of the body of a girl, who had just expired. M. Istotchnikoff placed a dying man in the bath, and covered him with bran; in order to interrogate him the better, he inclined towards him, and nearly touched his head with his own; scarcely had the patient been taken from the bath, than he died in an attitude such as rendered it impossible for the infirmarian not to receive a portion of his breath.

M. Dalaunay, a French physician, visited the hospital several times during the day; he interrogated the patients in reference to their symptoms before their admission; he inclined near their mouth, touched their tongue, head, hands, chest, belly, feet, and sounded such as had a retention of urine.

M. Zoubkoff discontinued the use of the chloride of lime, and conducted himself in relation to the individuals laboring under Cholera, as in ordinary cases of sickness.

Jean Stutzer, surgeon's aid, discharged his duties with great zeal, without using any precautions. Whenever he applied

leeches or cataplasms to the patients, he took their breath; his hands were often covered with their blood. He had an attack of Cholera after a diarrhea, which he had neglected for several days, and which arose from cold. His brother, also, without any precautions, received the clothes of the patients, who were brought to the hospital. More than once, M. Zoubkoff counted the linen covered with the dejections of the sick, exhaling a very fetid odor. He did not fall sick, nor did the two individuals who shared this occupation with him.

There were about thirty-two individuals attached to the hospital; all of them had touched the sick, the dead, and their clothes, had their hands covered with their cold perspiration, put them in the baths, or took their breath and the vapors from the bath, tasted the drink contained in their glasses, without any precaution, and without contracting any disease.

On arriving home directly from the hospital, M. Zoubkoff, no longer using the chloride of lime, and without changing his dress, sat at table with his family, and received the caresses of his children, firmly convinced that he did not carry a fatal poison, either in his dress or breath. No one refused his door either to him or his coadjutors; no one was afraid to touch the hand of the physician coming directly from the hospital; that hand which had just removed the perspiration from the faces of those affected with Cholera. Since the disease has been properly understood, no one, to the knowledge of M. Zoubkoff, has avoided the sick; and it is among that class of people, in which Cholera has proved most fatal, that the opinion of non-contagion was almost general. Does not the security with which they approached the sick demonstrate clearly that there was not one striking example of contagion?

Whenever the patient was able to speak, the cause of the disease was understood. It was always the consequence of cold, unhealthy or excessive food, or violent moral emotions. Thus, Ignace Andréyeff was attacked with Cholera in consequence of drunkenness; Jean Fèdoroff, for having eaten too much *caviar*; Nikita Iranoff, for having wet his feet in going out of a Russian bath, after which he took some brandy; M. Sokoloff, for having eaten an excessive quantity of goose at dinner, and drinking two glasses of cold beer on leaving the table. In general, all the patients brought to the hospital had been badly nourished, and they had lived chiefly on sour, rotten, and half-cooked cabbage.

If the Cholera had been contagious, adds M. Zoubkoff, the number of houses, in which there was only one patient, would have been much less than that in which there were several. A

hundred houses had only one patient; thirty-three, two; fifteen, three; nine, four; six, five; in the temporary hospital, six; in one manufactory, seven; in another, eight; in a third, nine; in one house, ten; in another, thirteen; in a third, twenty-one; in the hospital for old women, twenty-two; in the house of police, twenty-eight. For several days there were no patients except in the lowest part of the quarter. The increase and diminution of the number of patients did not occur daily; there were some days in which there was not one sick. The number and intensity increased during the wet days. The great majority of patients resided in a part of the city near the marsh, Moskwa, and canal. In the spring, during a thaw, the Moskwa and canal are overflowed, so that the water in the Quays reaches the windows of the lower floor. In autumn, the neighborhood of the marsh is covered with mud. The water in the canal, for want of a proper current, stagnates and fills the atmosphere with putrid effluvia. All the houses, in which there was a great number of sick, were filled with the poor, and generally with that class in which debauchery, drunkenness, and filth are habitual. In some of the houses, one room, divided into narrow apartments, contained sometimes thirty individuals. Should we be astonished that the miserable people, who reside in the lower part of the Quarter, who are frequently in want of healthy and sufficient nourishment, who are given to every species of debauchery, in want of warm and dry clothes, respiring a confined and often a damp atmosphere, have been more than others exposed to the cold, and to those gastric diseases, which are converted into Cholera? When there are causes so simple, why have recourse to the supposition of a virus or contagious miasma?

The individuals attached to the service of the patients sometimes contract the Cholera. It would be very extraordinary to admit that an epidemic attacks a man in his house or in the street, and that it does not affect persons found in the hospitals. The contagionists do not cite many cases in which persons were attacked with Cholera, without it being possible to find the slightest trace of contagion or miasma; on the contrary, when there are several persons in one family, or when the assistants in the hospital are affected, they cry out contagion, as if, in fact, people, lodged under the same roof or in the same hospital, were exempt from the ravages of the epidemic. Among those who approached the sick in hospitals, without employing any precaution, very few were attacked with Cholera; if the disease had been contagious, the contrary would have been observed. In some hospitals, the infirmarians, soldiers, and surgeons's aids were day and night

near the patients, and slept only at intervals. It was frequently necessary for them to pass through a muddy yard, during very bad weather. It is, therefore, natural to believe that fatigue and cold sometimes had an influence in provoking the Cholera. Of sixteen infirmarians in the hospital of Ordinka, who were well fed, and where the inconvenience of the muddy yard did not exist, but one was affected with Cholera in consequence of cold.

If a man, who has taken cold, should be affected with Cholera after having touched the sick, it is more reasonable to attribute this disease to the cold than to the absorption of miasmata, for we see thousands of cases in which cold has induced the disease, and we do not observe one in which it can be proved to have originated from the absorption of miasmata. A proof that it is not possible to explain in what way the Cholera was introduced into Moscow is, that the police of that city, notwithstanding their known activity, were unable to discover who had been the first attacked with this malady. Some believed that the disease appeared the 28th of September; it was afterwards said to be the 15th, and finally some individuals have asserted it to have been in the months of August and July.

That species of Cholera not having a tendency to intermittence, becoming developed in places remote from those which determine effluvial diseases, and continuing its ravages until winter, cannot be ranked in this class.

The Cholera has frequently appeared in places very remote from each other, without breaking out in the intermediate sections, and without the slightest communication existing between these places. The Cholera does not follow the direction of the winds. The clothes and objects appertaining to the sick have never propagated the disease. The Cholera, therefore, is not a miasmatic affection.

These remarks are, in my opinion, of great weight; they are the result of observations collected in those places in which the Cholera has prevailed. It is our duty to give a fair exposition of facts.

The Cholera Morbus declared itself in Poland the 10th of April, 1831, at Igania, situated eight miles from Varsovie, after a combat with the Russians. This circumstance has been brought forward to demonstrate the contagion and importation of this disease: but, according to M. Londe, M. Sauvé had already observed it in 1830, with the same symptoms. M. Londe attributes the developement, if not the origin of the epidemic of Poland to the expansive humid heat, to the almost constant electric state of the atmosphere, to the chilling of the body by the sudden va-

riations of temperature, and to the camp being pitched on a damp and marshy spot; to privation and excess, the use of deleterious food, the abuse of pork under all its forms, unhealthy water, and the use of ice drinks, particularly after a repast; to the emanations from the cadavera, and the impression of confined air; to chagrin, fear, anger, emotions, frequent want of sleep, and the excessive fatigue, inseparable from such a state of warfare. The Poles, who were affected with Cholera after the battle of Igania, had all been subjected to one or more of the causes, which we have just enumerated. When these circumstances were united in a very great degree in a particular section and the Cholera ensued, it affected but a small number of individuals, and it was in no case propagated. It has been supposed that the clothes taken from the Russians by the Poles, and worn by the latter, had been the agents in transmitting the Cholera. But since contact with the individual himself does not generate the disease, how can it be transmitted by a garment? Moreover, how often was this change made, before Cholera was communicated? It is even worthy of remark, that there were fewer cases of Cholera at Igania, than in the other districts of Poland. Among the Russian soldiers who fought near this place, and the prisoners who were taken, there did not exist a single case of Cholera. Several physicians and infirmarians, it is said, contracted the Cholera, and died at Varsovie. M. Londe replies that nothing appears to prove that they, as is pretended, had received the disease, instead of contracting it in consequence of the causes to which they were exposed. These facts are, moreover, contested. In the city, M. Lebrun constantly recognized the determinate cause of all the cases of Cholera which he treated. The Cholera manifested itself simultaneously in the military hospitals, in the low and humid quarters, particularly in the houses but little elevated. When those affected with Cholera were transferred to the hospital, the others never contracted the disease.

It has often been urged, adds M. Londe, that the popular voice was a decisive argument in favor of contagion; and we must admit that this argument has some weight in several diseases whose contagious character is doubtful; for although the popular opinion is not a scientific one, still it deserves attention: now, at Varsovie, in the higher and lower classes of society, among the nobles and peasants, there is not an individual who believes in the contagion; and among the great number of distinguished physicians at Varsovie, whose opinions we have collected, but two only, sustain the hypothesis of contagion.

There are yet some arguments, which we cannot pass over in

silence, because they are in favor of contagion. It is said that the Cholera follows public roads and rivers; that it appears successively on the different points of their borders; and that its appearance is successive. It is evident that the Cholera manifests itself in those places in which the causes of insalubrity are found to exist in greatest abundance. As to its progressive movement from east to west, and from south to north, is it in fact a movement? Can we admit a real passage of the disease, or of its immediate essential cause? Who has told you that this cause is specific, as you pretend; and if it be true, of which we cannot doubt, that a real and unknown cause is in reality nothing more than a creation of the fancy, are we not authorised in saying that we are unable to assign any reason why, since the year 1817, the Cholera has appeared successively in different portions of the south and east, north and west?*

This avowal has the precious advantage of supposing nothing, of prejudging nothing. It even leaves place for all the conjectures, in which the human mind may wish to indulge. We will limit ourselves to the remark that the supposition of contagion will not remedy this ignorance. In truth, notwithstanding the most severe regulations, the disease has appeared at different places nearer and nearer to our country. There is, however, nothing astonishing in this, for the transmission from one individual to another not being demonstrated by any fact, we do not say affirmed, for there is abundance of affirmations, how can we admit that there is a transportation of the disease?

The question concerning the contagion of Cholera is reduced to the following propositions: it may be that Cholera is contagious, that it may become so under certain circumstances; for there is, perhaps, no disease, particularly of the mucous membranes, which is not susceptible of being transmitted in peculiar situations,† but facts seem to establish that it is not so, and because we are unable to explain the extension of Cholera, it does

* Instead of saying—in such a year the Cholera showed itself in such a city, afterwards in another, and so on, it has been spoken of as a desperate traveller, who carries with him a fatal poison. Thus, it is said: the Cholera departs, progresses, arrives, stops, &c.; this figurative language takes for granted that which is now in controversy. The colored lines, by means of which individuals have designated the different places in which it has appeared on maps intended to serve as a history of the travels of the Cholera, are merely calculated to make the world believe that we are acquainted with that of which we are in fact ignorant. This mode of description may impose upon the eyes, but not upon our understanding. It will suffice to indicate the places devastated by this scourge, without uniting them by an hypothesis altogether gratuitous.

† Dict. Abr. des Sc. Méd.

not follow, as a necessary consequence, that this disease is communicable, or that it is importable.

If no fact exists, worthy of this name, (for simple assertions are not facts,) if there exists no fact to attest the transmission of this disease from one individual to another, there is still less proof of its propagation by means of wearing apparel, body, and bed linen; *à fortiori*, we possess no evidence of its importation by merchandize.

The contagion of Cholera, therefore, reduces itself to a mere possibility, against which we have to oppose observation. Let us add that analogy does not even bear it out. The Cholera is unattended by inflammation of the skin, or by any warm exhalation from this tissue, which is covered merely by a cold perspiration; the evacuations have no remarkable odor, after the discharge of the first gastro-intestinal matter; often, the serous matter alone is evacuated; the disease is of a very short duration; the emanations are neither abundant nor repeated; the matter and blood of individuals affected with Cholera have been inoculated. Nothing has denoted the contagion.

However, in admitting that the Cholera may become contagious, science undoubtedly goes beyond observation, but it does not exceed the limits of sound logic, for it is not conformable to reason to deny or admit absolutely a problem, when all its terms are not known. Now, if this argument holds good in Medicine, it assuredly is applicable to epidemics, a part of whose history is concealed from us.

In fine, the Cholera may be contagious; but, if it be transmissible, it must be so in a very small number of cases, for as yet we have been unable to assure ourselves of the fact. Every thing, therefore, tends to the opinion that the Cholera is an epidemic and not a contagious disease.

Perhaps the day may arrive when the medical world will be astonished that this subject ever drew forth so much discussion.

Because the Cholera has prevailed during very cold weather, and not always in the warm seasons, it has been supposed that heat and cold do not exercise any influence over the production or propagation of this disease. This proves, let us say it fearlessly, an ignorance of the effects of the atmosphere over our organism. Although the dysentery prevails more particularly during the warm and humid season, and is endemic in countries offering this double character, yet who does not know that it continues also during the humid and cold season? No one has yet denied the action of these two opposite conditions of the air, merely because they produced the same result. Every one is aware that the most

opposite causes often determine similar effects, and that vomiting, for example, is occasioned by warm water, an emetic, and wine.

In a pamphlet, written under the inspiration of the most noble sentiments, we read the folllowing questions: Is it not in consequence of anxiety and terror, that whole populations are disposed to succumb to the influence of Cholera? This Cholera, which would be nothing more than the simple endemic Cholera of all countries, in a time of calm and quiet, does it not assume the character of the Indian Cholera when the moral dispositions favorable to its developement, carried to the highest degree in a terrified population, present the conditions necessary for its propagation?*

The reply to these questions is to be found through the whole course of this treatise.

* *Observations sur le Choléra Morbus*, reçuillies et publiées par l'ambassade de France en Russie. Paris, 1831.

CHAPTER VI.

MORTALITY OF CHOLERA MORBUS.

A PROFOUND knowledge of the prognosis, that is to say, the art of predicting the terminations of a disease, interests both humanity and the dignity of our art, for there results from it a more assured march in the treatment, and a proof that knowledge presides over the application of the precepts derived from experience.

We have already, when speaking of the symptoms, divided Cholera Morbus into three kinds or varieties, according as life is not endangered, as it is threatened, or in fine as there is scarcely any hope of saving it, if indeed there be any.*

Sporadic Cholera Morbus is rarely mortal, when even it is accompanied by very violent symptoms. However, we should be guarded, and act as if the danger were in proportion to the intensity of the phenomena. Success frequently crowns the efforts of the physician, and often too, the patient recovers without the resources of our art, where the disease is very intense.

Such is not the case with epidemic Cholera, particularly at the commencement of its irruption; its victims are numerous, and the medical art is frequently unavailing.

At Bengal the mortality has been one in fifteen, eight, seven, six, five, three patients, a fourth, often a half, and sometimes more: for example, at Dangulpore, scarcely one patient in two escaped death; at Bombay, one in six died; at Madras, one in five among the troops, one in sixteen among the citizens. Siam, Java, Pekin, the Isle of France, Lahore, Mascate, Bassorah, Bagdad, Bender-Abouschir, Schirez, and Yerd, were subjected to immense losses. In Russia, three in five died. Among the Cossacks of Oural six in seven fell victims. M. Moreau of Ionnès, after innumerable calculations, states that in Hindostan, one person in ten was attacked with Cholera, and that one in sixteen perished; whence he concludes that India has lost, by this scourge, eighteen millions of inhabitants in fourteen years. He has remarked that a sixth of the population of Persia perished, under the influence of a dry and very elevated temperature. In fine, from one-sixth to two-thirds of the sick perished which gives a medium term of

* Page 78.

three-eighths. The number of women who have died scarcely equals one-fourth of that of the other sex, which we may attribute to their constitution, habits, and regimen. It is evident that these three circumstances are not without action in the production of Cholera Morbus, since they exert such an influence over its mortality. In Persia, the longest irruption continued one hundred and fourteen days, and the shortest, about twenty. Its duration is greatest in the summer season. In Russia, the Cholera attacked one man in two hundred and ten, and proved fatal to one in three hundred and fifty.*

Without endeavoring to distinguish what is true and what hypothetical in these accounts, it is evident that the epidemic Cholera has frequently been fatal to more than a half of those it attacked; that the differences in the mortality are very remarkable, and that even in supposing that the occult cause to which this disease has been attributed varies in the different countries where it prevails, we are obliged to admit, after having denied it, that the circumstances of the atmosphere, country, constitution, sex and race, have some influence in the manifestation of Cholera. It is thus, that, often after having repelled facts, we are assailed by them in a manner which will not permit us to avoid them.

The excessive mortality of Cholera, when it appears in a country, is inexplicable; but certainly this does not militate in favor of contagion or infection; for it is the property of both one and the other to become more and more active in proportion to the number of persons attacked, until the number of individuals disposed to contract the disease is nearly exhausted. Remark, that the contagious diseases and those which are due to infection require individual predispositions for their developement. Thus, when even Cholera should be found manifestly contagious, it would be an egregious error to contest the effects of heat, cold, humidity, moral affections, &c.

Besides the nature of the disease and the aggravating circumstances, the mortality of Cholera Morbus is extremely increased by fear. *Meticulosi præ omnibus in pestem in currunt*, observed Cardinal Gastaldi. This is applicable to persons who manifest excessive dread of the Cholera.†

We may observe, that this epidemic has affected a smaller number of persons, proportion guarded, in Russia than in India, and also that the mortality has not been so considerable in the former place. The mortality, it is true, was immense among the

*Op. cit. Chap. iii.

† I am indebted to Professor Desgenettes for an extract from the important work of this learned prelate.

Cossacks of Oural, but a small number of them only were affected; and, moreover, we should not be surprised to find a more remarkable fatality among a people in the last rank of European civilization, and consequently exposed to the action of the various causes of destruction by which they are surrounded.

We do not possess any authentic documents in regard to the mortality of Cholera Morbus among the heroic Poles: it must, however, have been considerable. The war for independence, the privations inseparable from it; the despair which enervates the most intrepid warrior, when his veins are deprived of a generous blood; the cruel anxiety for his country, friends and neighbors, every thing, in fine, united to favor the developement and increase the intensity of the scourge, which added to the number of so many other evils.

Will the Cholera be as fatal in France as it has been in many other places? Our country is happily free from excessive heat and intense cold, the humidity is moderate, the regimen more salubrious, excesses less common and less violent than in the east and north of Europe; and cleanliness prevails with us, at least in a greater degree than in Russia and Poland. Different articles in Germany, such as the immense stoves, meal cakes, unleavened and half-cooked, spoiled sour crout, the abuse of pork, and the exclusive use of beer, are unknown or less common among us. There also exists among our citizens a certain indifference for life, which preserves them, in a wonderful manner, from that mental anxiety, to which are to be referred disturbed digestion and nervous irritation.

All these circumstances justify us in the belief that the Cholera will be less intense, less fatal with us than it has been in the rest of Europe, and particularly in India. These same circumstances give room to hope that our country will be preserved from this scourge.*

However, medical men should be on their guard, and ready to struggle for the public good. Every one should endeavor to prevent its ingress, and, if this prove unavailing, to moderate the effects of this formidable epidemic.

Can the treatment exert any influence over the mortality of Cholera Morbus? This question we shall examine in the following chapter.

* Schotteten; *Histoire du Cholera Morbus*; Metz, 1831. We regret exceedingly that this skilful anatamo-pathologist has not reported in detail the eighteen autopsies, which he made at Paris and Toulouse, of persons affected with Cholera; in all he found traces of inflammation, and various lesions in the digestive organs.

CHAPTER VII.

TREATMENT OF CHOLERA MORBUS.

We have seen that Hippocrates mentions hellebore as having been given in a case of Cholera Morbus. He has been censured, because it was supposed that this prescription originated with him, but he merely reports it as a fact.* He does not give any rules in reference to the treatment of this disease.

Celsus recommends that a quantity of warm water should be given as soon as the symptoms begin to appear. When the vomiting is arrested, we must immediately stop every kind of drink. If there should be griping, it will be necessary to apply to the stomach cold and wet fomentations, or warm, if the abdomen is painful; it is even proper in this case to keep the belly tolerably warm. If the thirst, stools, and vomiting torment the patient considerably, and if the matter vomited is but half-digested, we should merely give warm water, and cause the patient to respire some pennyroyal dipped in vinegar, barley meal sprinkled with wine, mint, or some other similar substance. When we are apprehensive that the patient will become too much debilitated, we must have recourse to wine. We should use that which is light, odoriferous, diluted with cold water, or mixed with the meal of barley, or with honey. If the patient becomes very weak, and the legs draw up, we must add an infusion of wormwood to what has just been mentioned. If the extremities are cold, they should be anointed with warm oil, to which may be added a little wine; the heat must be recalled by means of warm fomentations. If, notwithstanding these remedies, the symptoms still continue, a cupping glass or mustard plaster must be applied to the epigastric region. When the vomiting has ceased, the patient should endeavor to sleep, abstain from drink the following day, take a bath the third day, and gradually repair his strength by generous nourishment and a long sleep, if he sleep easily; cold and lassitude should be avoided. If after the Cholera slight fever should continue, it will be necessary to give lavements, and afterwards to allow wine and nourishment.

Areteus recommends to favor the vomiting by means of warm water given assiduously, but in small quantities, in order not to produce an over-excitement in the stomach. If colic should ensue, and

* Page 10.

the feet become cold, he advises to rub the belly with a greasy substance mixed with rue and cumin; it must then be covered with linen; the feet should be gently rubbed at the same time that they are covered with this embrocation. When bile is perceived in the matter vomited or dejected, it will be necessary to give two or three glasses of cold water at a dose. When the pulse becomes small, and perspiration shows itself on the forehead, neck, and other parts, if diarrhœa and vomiting continue, and the patient appears to be sinking, it will be proper to administer small doses of aromatic wine in cold water. If all the symptoms increase, the perspiration, spasm of the stomach and nerves, hiccough, contractions of the feet, diarrhœa, dimness of sight, and diminution of the pulse, we must give wine abundantly with cold water, together with astringent aliments, such as apples, quinces, and grapes. If the stomach does not retain any thing, we must have recourse to warm drinks and aliments; sometimes, we succeed in this way in arresting the vomiting. If no relief be obtained, we must recur to the application of cupping glasses either on the back, between the shoulders, or below the umbilicus. The glasses should be frequently renewed, in order that their pressure on the skin may be of short duration, for it excites pain. Should the patient become worse, we must act as in syncopy, that is, apply stimulating aromatics to the abdomen and chest. If the feet and muscles contract, they should be anointed with old oil united with castor. If the feet become cold, we should apply to them, the vertebral column, tendons, muscles and maxillæ, a liniment of Euphorbium. If the perspiration and diarrhea cease, if the stomach will admit food and not eject it, if the pulse becomes full and strong, the spasms disappear, the heat increases, particularly at the extremities, if some calm should be procured by sleep, it will be proper to purge the patient the second or third day, and allow him to return to his accustomed habits.

If, on the contrary, the vomiting ejects every thing that has been taken into the stomach, if there is a constant cold sweat, the patient chilled and livid, the pulse falls, and the strength fails, Areteus gives the ridiculous advice to fly.

Cœlius Aurelianus recommends warm drinks, gentle frictions of the articulations, afterwards the administration of cold water, and in fine, of vinegar and water; we must, in addition, apply refrigerating, aromatic cataplasms on the thorax and abdomen. If there be pain and distress in the intestines, the extremities should be enveloped in linen and rubbed with mild oil; warm infusions should be administered as drinks. We should also apply cupping

glasses. If the pain continues, and the diarrhea appears to increase, they should be applied not only to the epigastrium, but to the other parts of the body. Cold water is then given at intervals. If there be an amelioration, we may allow cordials, aliments, soups, potage, also eggs and bouillie. If the stomach rejects them, it must be suffered to repose, and we begin again the use of these articles. We re-commence in this way three or four times if it be necessary. A cupping glass is to be placed below the false ribs at the same time that the patient takes nourishment. At the decline of the disease, we may order pears, apples, grenades, grapes, partridges, pheasants, and olives. If the strength becomes re-established, bread moistened with wine and water may be allowed. If fever supervenes, and the strength will permit it, the patient should diet, or take nourishment only during the remission. When the force returns, a bath is to be administered.

According to Cœlius Aurelianus, Diocles recommended that the patients should be cooled, that they should take cold drink, and that acorns should be put into their anus; wormwood and milk were proper when there was hiccough, and to the latter article it was usual to add the extract of poppies. Praxagoras recommended acetic hydromel with the wormwood; he advised it to be taken warm at first. If the vomiting is very evident, the patient is bathed, and he is recommended to repose himself; if he is unable to sleep, he is given some bouillie, and cold or warm hydromel; and when the vomiting has subsided, lentils and wine are to be administered; if the vomiting persist, it will be necessary to recur to the bath, and other remedies just indicated.

Erasistratus advises warm drinks, warm vapors, cataplasms of meal and wine, wine of Lesbos with cold water, that is a few drops of wine in a cup of water, in order that this last may have the odor of wine; this should be taken after violent vomiting, and after each alvine evacuation. Water should predominate, especially if there is any fever; we should then give lentils and wine, or an infusion of apples or pairs, and finally a bath. Asclepiades prescribed the bath and wine with the bouillie. Heraclides of Tarentum recommended, in order to arrest the evacuations, henbane, aniseed, and opium in cold water. Cœlius Aurelianus has made some judicious remarks on the different modes of treatment.

Alexander of Tralles recommended wine internally, then aromatic liniments, topical excitants, applications composed of balsam, emollient cataplasms, and cupping glasses.

Of the three patients, mentioned by Zacutus Lusitanus,* the woman had been subjected to the use of astringents, roborants, and cupping glasses; the patient aged sixty, had astringents and narcotics to the sinciput, nose, temples, soles of the feet, and cupping glasses to the belly; he took rhubarb several times and finally made use of the syrup of medlar, and chalybeated milk; the veteran took a number of medicines, and a syrup composed of sumac, wild pomegranate, and tressil.

Bontius recommends, as much as possible, the use of astringent medicines against the Cholera, of corroborents taken into the stomach and intestines, and a syrup composed of fresh lemons, together with myrobalents.

Sydenham advises that a young chicken be boiled in a large quantity of water, so that the decoction may have but very little taste of the flesh of the animal. The patient is then to drink one after another several large glasses of this warm decoction, or, in case he has not this, milk whey; at the same time several lavements composed of the same decoction are to be administered; to each glass of the drink and to each of the lavements, we may add an ounce of the syrup of violets, lettuce, purslain, and water lilly. After this, which must be continued for three or four hours, the treatment is terminated by the administration of a narcotic. If the physician should not arrive until after the vomiting has reduced the patient to the last stage, and the extremities are cold, it will be necessary to have recourse to the liquid laudanum, twenty-five drops, for example, given in an ounce of strong cinnamon water. When the symptoms are relieved, it will be proper to repeat this remedy every morning and evening, but in smaller quantity, until the patient is perfectly re-established. Children should be treated by laudanum alone; we may give two, three or four drops, according to the age, in a spoonful of small beer or some other appropriate liquid, and the remedy should be repeated as often as it may be necessary.

Hoffman is of opinion that there are few diseases in which the *methodus expectanai* is less indicated than in Cholera; the sooner it is treated, the greater hope we have of success. He recommends warm water, to which is added a quantity of fresh butter, the decoction of oats or barley, the milk of almonds, milk, oily, emollient lavements, absorbing earths, treacle, and milk whey, in order to calm the the thirst. He has employed cold water with great success. For the spasms he recommends most absurd remedies, among which it will suffice to mention

* Page 21.

the *râpure du penis de cerf*, then different pills of cynoglosse, storax, and finally the anodyne liquor bearing his name which, mixed with the oil of mace or the tincture of castor, is very much lauded by him. In addition he recommends a number of spirituous, balsamic, and aromatic applications; then come veal and chicken broths, *chicorée*, parsly, asparagus, chervil, lemon juice, mixed with the strong tincture. In a word, he prefers the milk whey to milk in its pure state. Evacuants should be rarely employed against Cholera, except in the shape of lavements, or such as rhubarb, manna, and the mild laxatives; he commends the oil of henbane. Blood letting is indicated when the patient is vigorous. After the Cholera has ceased, it will be necessary to prescribe for some time, milk, butter, barley boiled in chicken broth or milk, and finally milk whey. Milk should not be given when fever associates itself with Cholera Morbus.

Sauvages advocates the method of Sydenham. When, says he, the patient preserves his strength, we give him warm water, chicken broth, and even if the pulse is strong and the pain considerable, blood letting should be practised. Every five hours light broth should be given, but the patient has difficulty in retaining them; and for this reason, after sufficient evacuation, the anti-emetic of Riviere is administered. If there be pain and debility, we add to this potion, every hour of the day, twenty drops of liquid laudanum, and according to circumstances, mint, cinnamon water, and the oil of sweet almonds: these remedies will procure a truce, during which the patient retains the broths. We then administer lavements, prepared with a decoction of the tripe of mutton, in small quantity, especially if the patient should be troubled with a painful tenesmus, which is seldom the case. In proportion as the vomiting occurs, we have recourse to the anti-emetic, and towards evening to the laudanum, which is very proper to arrest the flux. Lemonade must be used as a drink three days after the cessation of the vomiting and diarrhea. It will be necessary to purge the patient with a decoction of rhapontic, myrobalants and the compound syrup of chicorée, or by adding a small quantity of manna.

Sauvages has made mention of the Indian Cholera; according to Delon, he indicates the following treatment against this variety:—The first and principal remedy, says he, is to burn the feet; we apply a rod of red-hot iron to the hardest part of the heel and continue the application until the patient gives evidences of pain; the rod is then to be removed immediately, and the part thus burnt is to be struck several times with a soft shoe in order to prevent the appearance of blisters; this burn will produce but

slight pain, and will not prevent the patient from walking, provided the principal disease will permit it. However, it will only tend to alleviate the violence of the malady. If fever should be present it must be attacked by the ordinary remedies; the patient must be nourished with a decoction of rice, to which a quantity of pepper is added, notwithstanding the existence of fever; powdered pepper is also to be put on the head; we bleed, and, when the disease has yielded, we make use of gentle purgatives. Delon has employed this mode of treatment successfully, as well upon himself as his patients.

In inflammatory Cholera Morbus, Sauvages recommended blood letting, emollient fomentations, chicken water, and emulsions. Quarin objects to bleeding, as recommended by Wittringham, for the purpose of removing the pains of the abdomen. When the pulse is small and irregular, the patient is covered with a cold perspiration, and falls into syncopy. Those physicians, says he, who, deceived by the bitter mouth and vomiting, employ emetics, will expose their patients to serious danger. He who endeavors to excite vomiting in this disease, is as reasonable as he who, after an excessive loss of blood, would order blood-letting, or he who, in order to arrest the colliquative perspiration, would administer diaphoretics to his patient. If, after vomiting has continued for some hours, hiccough, great debility, dimness of vision, and insensibility of the pulse ensue, we should immediately have recourse to opium. Twenty-four drops of laudanum are put into three ounces of balm water and into half an ounce of the syrup of kermes; of this mixture half an ounce must be taken every four or six minutes, according to circumstances. The patients ordinarily eject this remedy, and others require a much larger dose of laudanum. It will be necessary, should an apothecary not be at hand, to prescribe more opium than usual; for if another dose should be required, the patient may die before it can be procured. During the vomiting even, or after it has ceased, we order the patient to take an infusion of balm, or some light chicken broth. When the pains are acute it will be proper to put soothing applications on the abdomen; but if the patient should vomit continually, and experience at the same time considerable weakness, small bags filled with aromatic herbs, such as mint, or rosemary, are preferable to the cataplasms. These bags are to be dipped into warm wine, and, after being squeezed, placed upon the epigastric region. If all these remedies are ineffectual in obtaining relief, we should prescribe small blisters. When the disease has terminated, we prescribe the extract of quinine, half an ounce; balm water five ounces; syrup, *q. s.* Good

wine is likewise indicated. If the patient complains of a sensation of weight in the region of the stomach, or the bowels are inactive, we may add to the above mixture from six to twelve drachms of the tincture of rhubarb. It will be important to avoid with great care the cold air, and to keep the feet moderately warm. Quarin is of opinion that intermittent Cholera Morbus is not to be treated by diluents and purgatives, but that the paroxysms should be arrested as promptly as possible by the use of quinine.

When we mentioned the cases of Cholera Morbus collected by M. Sengensse, we likewise indicated the treatment to which he had recourse.*

I. P. Frank approves of emollient drinks only in the first moments, when the diagnosis is yet uncertain. He objects to blood-letting, notwithstanding its success among the English and Germans. He approves of applications to the epigastrium, and cold drinks, when the debility is not too great, and recommends the use of wine in small quantities. The anti-emetic potions are sometimes useful, but he prefers opium. If this divine remedy, says he, has ever proved injurious at the commencement of Cholera, it was not by preventing the evacuations, but by arresting too suddenly the convulsive agitation of the alimentary tube, which might be abandoned to itself for sometime. The physician is almost always called too late. He should hasten to prescribe narcotics. The mixture of opium with substances disagreeable to the taste or capable of fatiguing the stomach by their quantity, an excessive dose of this narcotic administered alone, will frequently provoke vomiting; in such case, we should prescribe, at first, fifteen drops of the tincture of thebes, afterwards ten drops every quarter of an hour, until the vomiting ceases; these drops may be given on sugar or in a small quantity of balm water, or even ordinary water. The employment of the remedy must not be suspended as soon as the symptoms have subsided; unless it occasions stupor, it should be continued for several days at longer intervals and in smaller doses. Those physicians, who recommended repeated lavements, when the evacuations are already too abundant, have never seen the disease in all its intensity; they are not aware of the difficulty experienced in placing the patient, in the midst of his agitation and exhaustion, in the position required for the administration of lavements. However, if the opiate potions should not arrest the diarrhea, we may use opium in a semi-clyster prepared with broth, the yellow of an egg and oil of sweet almonds. At the same time a plaster of treacle,

* Page 30.

bags of aromatic plants moistened with vinegar, wine or lavender, should be placed on the epigastrium. When the bas-ventre is the seat of violent pains, it should be covered with fomentations and light cataplasms.

Coldness of the extremities, weakness, trembling, intermittence of the pulse, obscurity of the sight, and frequent fainting, require continual fomentations and frictions on the extremities, with an aromatic infusion. When the Cholera is intermittent, we prescribe quinine in conjunction with the tincture of thebes.

After we have succeeded in arresting the symptoms, we should endeavor to re-establish the strength, being careful not to employ any irritating or disagreeable remedy, which might recall the spasms. The different bitters are the most proper medicines. We may, during convalescence, prescribe the decoction of columbo root with wine, when the abdomen is yet relaxed. At a later period, we may give the tincture of mars with cinnamon water. The food should be nourishing, easy to digest, and taken in small quantity. Country air, agreeable society, and moderate exercise will complete the cure.

Pinel imagined that even the mildest purgatives and narcotics were injurious, the first by inducing a new degree of irritation, the others by arresting the movement and efforts necessary to expel a deleterious matter, unless these last were given at the decline of the disease, for the purpose of procuring calm. He recommended the use of diluting or acidulated drinks, such as chicken and veal water, decoction of barley, and the mucilage of gum arabic. In a violent case of Cholera Morbus, which occurred during the heat of summer, the patient was put upon the use of currant water and sugar, and the disease terminated favorably in twenty-four hours.

We have seen that General Desaix prescribed, not without success, antiphlogistics and the internal use of oil, in cases of Cholera Morbus induced by the indigestion of the grains of recin.

M. Geoffry would not propose blood-letting in the treatment of Cholera Morbus, although he regarded it as an inflammatory disease, so much was he imbued with the idea of a prostration of vital power. In his opinion, it required the judgment of a consummate practitioner to decide whether it was even indicated. He likewise prescribed the use of emetics, (except when the stomach was surcharged with an excessive quantity of fruit, or contained some injurious substances, which it was necessary to have discharged promptly;) veal or chicken water, milk-whey, given in small and frequent doses, emollient lavements with the

addition of the oil of sweet almonds, emollient fomentations, baths for several hours, a small dose of treacle, a plaster of the same substance sprinkled with laudanum and placed on the painful parts, are the remedies which he recommends. If the symptoms increase but gradually, orangeade, weak lemonade, and currant water. When the evacuations begin to diminish, we will employ with advantage the potion of Revière prepared even at the bed-side. But if the physician should not be called in until after ten or twelve hours continual vomiting, if all the symptoms indicate great danger, if the disease progresses with extreme rapidity, we have no resource left, but to employ the syrup of karabé or diacodium first, then laudanum or the watery extract of opium, in the dose of one or two grains dissolved in mucilage, even after the cessation of the evacuations. Musk, ether, camphor are without any efficacy; quinine is generally injurious; in desperate cases, a large blister or any other rubefacient placed on the abdominal parietes, has sometimes proved very advantageous. During convalescence, several days after the disappearance of the symptoms, it is often useful to purge with the compound syrup of chicorée, or with the decoction of prunes; later, with cassia, 'or tamarinds. Should any of the symptoms re-appear, we must have recourse to emollients; afterwards, the different chalybeates are to be employed. We should not attend to the presence of worms, the cessation of the menses, or the previous disappearance of any other disease. until the most alarming symptoms are subdued; we then order mucilaginous food, and the patient may gradually return to his accustomed regimen.

M. Ranque has published in France a remarkable little book on the Cholera Morbus, a summary of which we cannot avoid giving in this place. He recognizes four species:—Neuralgic, neuro-adynamic, remittent and intermittent, and neuro-phlegmasique.

"From 1822 to March, 1831," says M. Ranque, "I treated more than eighty persons affected with Cholera Morbus. Of this number, sixty commenced with slight symptoms, which soon disappeared :—I restrored twenty, by a small number of leeches, applied to the abdomen, near the umbilicus, mucilaginous warm applications made to the abdomen; mucilaginous acidulated drinks, hip-baths, emollient lavements, and a severe diet; fifteen, by entire baths, mucilaginous warm applications on the belly, sprinkled with laudanum; lavements with the infusion of linden; drinks composed of dog-grass with a small quantity of orange-water; no leeches. In the twenty-five remaining cases neither leeches nor mucilaginous applications were employed. Edulcorated barley-water was given as a drink, sometimes mixed with

milk. Among some of the patients, whose symptoms were somewhat intense, we employed our sedative liniment on the internal part of the thighs, on the spine and legs, and the recovery was more prompt than under the use of topical applications, sprinkled with laudanum. It will suffice to mention that we combatted successfully the inflammatory symptoms by means of leeches, and the rigid antiphlogistic regimen. We tranquillized the nervous excitement by baths, opiate applications to the abdomen, drinks, slightly aromatic; and afterwards by edulcorated barley-water. As regards the twenty other patients who, from the commencement, offered extremely dangerous symptoms, and in the greater number of whom we observed the inefficiency of the medication we have just mentioned, we collected daily the phenomena which they presented, the treatment adopted, and its results.

"Those cases, which presented merely an intense nervous excitement, that is, vomiting, and frequent involuntary alvine evacuations, acute pains in the intestines, without any complication of inflammation, without any profound adynamia, were all promptly cured by the application to the abdomen of the following plaster:—

"Take hemlock and diachylon, of each half an ounce; allow this mass to soften in warm water, and add to it an ounce of the substances entering into the composition of treacle; a drachm and a half of powdered camphor; half a drachm of powdered sulphur. Mix the whole well together; then spread it on a piece of linen large enough to cover the whole abdomen, from the epigastrium inclusively to the pubis. Before applying this plaster, it should be sprinkled with the following mixture:—tartrate of antimony, and potash, a drachm and a half; powdered camphor, a drachm; flowers of sulphur, half a drachm. It must be fixed on the abdomen by means of a bandage. It should not be disturbed for three or four days, if there is an amelioration of the symptoms, and in the contrary case it should be renewed the following day; an application should be made three or four times a day or oftener, on the interior of the thighs and legs, and on the lumbar region of the spine, with a spoonful of the following liniment:—cherry-laurel water, two ounces; sulphuric ether, one ounce; extract of belladona, two scruples. In most of the cases, eight hours scarcely passed after this treatment, when the patients began to experience the happiest effects from it; the vomiting was calmed, the alvine dejections became less frequent, and the pains much less distressing. As long as the vomiting continued, I did not allow any thing but a few spoonsful of edulcorated barley water; most usually the dangerous symptoms of Cholera had disappeared on the following day; the patients experienced extreme fatigue, the natural effect of the violent pains

they had undergone, and a great desire to sleep, which they did not find it difficult to gratify. The appetite soon manifested itself; by indulging it with some degree of caution, recovery was soon effected. Among some of the patients, the amelioration of the symptoms not being so rapid, we found it necessary to renew the application of the plaster to the abdomen ; this was sufficient to ensure a cure. Some of the patients having been affected with this disease for several days, and presenting all the symptoms of profound adynamia—thready pulse, cold perspiration, contraction of the calves, and decomposition of the features—after covering the abdomen with our warm plaster, we made use of friction every hour on the spine, the interior of the thighs and legs, and the precordial region, with the following liniment ;—oil of cammomile, two parts ; ethereal tincture of yellow quinine, one part. Each friction consumed about one spoonful of the liniment; in proportion as the vitality became re-established the frictions were employed less frequently. Conjointly with these means, we prescribed barley water, mixed with two thirds the quantity of wine. A spoonful of this potion was given every hour.

"Among the first patients I was called to treat, who presented quotidian paroxysms of Cholera Morbus, I employed the plaster already mentioned ; I merely added half a drachm of the sulphate of quinine to two ounces of the liniment made with the ethereal tincture of quinine and oil of cammomile. The paroxysms yielded promptly to this medication.

"In a small number of patients I considered it necessary to apply leeches to the abdomen, in consequence of the great heat of its parietes, the intensity of the fever, the dryness and heat of the skin ; I likewise covered the belly with mucilaginous and warm substances ; the drinks were aqueous and emollient. The local sanguineous depletion, the antiphlogistic applications and drinks tended to remove the inflammatory symptoms, and I obtained, by the use of these means, a complete cure of such as had nothing more than a phlegmasia ; but in those patients in whom, besides the phlegmasia, there was observed an evident nervous excitement, the antiphlogistic treatment was insufficient; these symptoms were relieved only by having recourse to my plaster and sedative liniment.

"A young man, very vigorous, suddenly attacked with Cholera Morbus, during the heat of the month of July, 1825, and presenting nothing but the nervous symptoms in the highest degree, was promptly cured by the application to his abdomen of a cataplasm of flax seed, covered with stibiated tartar, camphor and

flowers of sulphur, and by frictions made on the thighs, legs, and spine, with my anti-neuralgic liniment, composed, as has been mentioned above, of cherry laurel water, extract of bellodona and ether. This patient had previously taken, without effect, a large dose of opium. A child eight years of age, attacked with a very painful Cholera Morbus, was also promptly relieved by the use of this cataplasm. In three other cases, this cataplasm was not attended with the same success. However, I think it should be employed, as also the resin covered with the same powders, that is, with stibiated tartar, camphor, and flowers of sulphur, in cases in which it would be impossible to procure our plaster, which, in our opinion, exerts the happiest influence over the economy, in consequence of the aromatic substances which enter into its composition."*

M. M. Rochard and Noel, in 1781, on the Coromandel coast, and in the Isle of France, and Kuttinger, in 1810, in Calabria, assure us that they employed with advantage ammonia internally, at first, in the dose of thirty-six drops in a strong infusion of balm edulcorated with a sufficient quantity of sugar; afterwards, ten drops only of the ammonia were taken, every two hours, in the same vehicle. After the third or fourth dose all the alarming symptoms were dissipated; the vomiting became less frequent. The colic and burning heat of the alimentary canal, as also the cramps, became insensibly relieved after the first doses; the pulse became stronger, and the patient soon fell into an agreeable repose. It was very rarely necessary to go as far as the seventh dose; emollient, mucilaginous, and warm drinks terminated the cure.

Yugamuni Chintamani mentions the following remedies for *Sinanga:*—Soda, sulphur, mercury, orpiment, carbonate of steel, copper, zinc, and lead; powder all these ingredients; add myrobalants to them; let them boil for three days, in a decoction of *perpatam*, a cooling herb: mix a portion of serpent's gall with them, and make them into pills of three grains each. If the diet be rigidly observed, this remedy will cure the spasmodic chill of the whole body.

Produce a cessation of the morbid symptoms of the mucous membranes, and establish the circulatory action on the surface of the body—such are, according to M. Christie, the two principal indications in the treatment of Cholera Morbus. We should never lose sight of the first; the second presents itself when the disease has already made some progress. We should conform to the circum-

* *Memoire sur le Cholera;* Paris, 1831.

stances of each case, and pay particular attention to the symptoms. We cannot hope to discover, for this disease, a specific remedy applicable in all cases; and the practitioner should exercise his judgment in the treatment of Cholera precisely as in that of any other disease. Although blood-letting, he observes, is generally considered as one of the most potent remedies we can oppose to Cholera, I think it should be employed more frequently than it has heretofore been. It is indicated not only in the robust European, but also in the most debilitated Indian. Blisters and sinapisms are among the most efficacious and certain remedies we can prescribe in Cholera. I have generally had applied to the abdomen, and sometimes to the chest, a strong plaster of cantharides, and cataplasms of mustard and pimento to the feet and legs. In the most desperate cases, the application of boiling water has produced the most favorable results. Opium is very proper in the catarrhal form of the disease. But when there is inflammation, it should be employed only to calm the vomiting, and if its use be prolonged, it will tend to increase the phlegmasia. We should therefore prescribe it with great caution. Alcohol, ether, and the different stimulating tinctures act nearly in the same way as opium; they are especially indicated in the first period of the disease, when the stomach can retain them, and when the blood flows in less quantity towards this viscus. Their use is contra-indicated, whenever there is pain or heat in any part of the abdomen. The aromatic and heating vegetables are admissible only when the disease exhibits a catarrhal character; they should be combined with alcohol, calomel, and purgatives; among the tonics, the bitter should be preferred in the treatment of Cholera. Calomel, the most common remedy employed against this affection, is inadmissible in the inflammatory form of Cholera. In the contrary case, calomel will prove very efficacious, whether given alone, or united with other purgatives. In the catarrhal form this latter combination is useful, for otherwise the calomel would sometimes become arrested in the stomach, or in some part of the intestinal canal, and thus provoke inflammation. Mercurial fumigations procure an abundant perspiration, and a very small number will be sufficient to occasion salivation. When there is much oppression in the respiration, and the mucous membrane of the bronchiæ participates in the affection of the gastro-intestinal membrane, the medicines would perhaps be usefully employed under the form of gas. Lavements are attended with great success. Cold drinks are evidently contra-indicated in the catarrhal form of Cholera; on the contrary, warm drinks are strongly indicated by several symptoms of this disease.

M. Scott has aquainted us with the different remedies employed in Cholera Morbus at Madras.

Opium was the medicine in most general use. Among the natives more than among the Europeans, it proved efficacious when given before prostration commenced. The ordinary quantity administered at each dose was from eighty to one hundred drops of the tincture, and from two to four grains of the solid opium; the tincture was frequently given in doses of two or three drachms. The practitioners increased or diminished the quantity, or continued that which has just been mentioned. After having employed this medicine in a liquid form, it was ordinarily administered in pills or in a soft paste. These last preparations were retained the best. Several cures were affected without the aid of opium; in many cases it did not prevent a fatal crisis. It appeared the more effectual, in proportion as the local signs of the gastro-intestinal affection were more manifest; preseverance in the employment of this remedy until the end was not attended by happy consequences. It should never be omitted in the commencement of the disease; as an anodyne, we should give from sixty to a hundred drops of the tincture; as a stimulant, the solid form is preferable, in the dose of from three to five grains. Ether, ammonia, camphor, castor, mace, the mercurial oils of peppermint, cloves, cinnamon, the different aromatic tinctures and bitters have been given alone or combined with calomel and opium, but without success; these remedies have always aggravated the distress, particularly in persons tormented with thirst, and who had a burning heat and fixed pain in the stomach.

Wine and spirituous liquors have been administered during the first moments with incontestable advantage; but at a later period they proved ineffectual. The most fatal symptoms very frequently occurred during the use of remedies of this kind.

Calomel was prescribed almost as soon as opium. Fifteen grains of it were placed on the tongue and the patient swallowed them, taking afterwards a hundred drops of the tincture of opium. The quantity of calomel given, under different forms, has been very considerable; it has often been found lining the internal surface of the stomach; when given in a bolus, it was found surrounded with a greenish mucus, and traces of inflammation were visible. The success of those practitioners who, has not employed calomel from the commencement, is as great as that of the physicians who have administered it on the first attack of the disease. We may regard the general employment of this remedy at the commencement, as premature and injudi-

cious. Calomel is not a remedy that may exist in a passive state in the stomach; if it effect no good, it may do considerable mischief.

Blood letting has often been practised with success; and frequently it has not been followed by any happy result. We may observe that prostration has not appeared to be a real contra-indication to the use of this remedy. One remarkable circumstance however, may diminish the good effects of the lancet: it is that we are not always enabled to obtain blood or at least as much as it is necessary to abstract. We must frequently take away a considerable quantity of blood, notwithstanding the prostration, in order to have any good effects. It was generally supposed at Madras that it was not proper to abstract less than thirty ounces. In order to favor the flow of blood, we should rub the arm, plunge it into warm water, and prescribe stimulants. I have succeeded, observes M. Annesley, in every case in which I had recourse to blood letting, when it was possible to practise it; and, among the patients whom I treated, blood letting, instead of producing syncopy, was always followed by an amelioration in the pulse and the disappearance of any disposition to fainting and debility.

The medical bureau of Madras have recommended to give anti-spasmodics and stimulants before using the lancet.

The extraction of blood by means of cupping glasses does not offer less inconvenience than the opening of the veins by the lancet. However, we should always have recourse to local bleeding, when what is properly called general bleeding is not practicable. We should prefer the sternum and abdomen, unless there is some one point particularly painful. It would perhaps be proper to select a spot in the vicinity of the spinal marrow. In order to practice bleeding with advantage, the patient should be in a convenient attitude, and sustained by cordials. As regards the choice of the vessels, we must remember that the principal object is to obtain the requisite quantity of blood.

Baths of ordinary water strengthened by the addition of spirits, aromatic plants and common salt, have been very much extolled; but unfortunately the employment of these means is always slow, often difficult, sometimes impossible, and always fatiguing to the patients. The vapor bath has not proved more useful although much more easily prepared. These remedies warm but feebly and momentarily the skin, when this is cold and humid, and the pulse scarcely sensible. In certain formidable cases, the patients whose skin was as cold as ice, found that even a moderate degree of heat was scalding and intolerable.

Baths of warm sand have appeared preferable. The use of flannel sacs, filled with warm salt or sand, have been prescribed. Strong frictions practised with a brush or warm flannel have proved very useful. In making these frictions, physicians employed stimulating tinctures, acrid embrocations composed of garlic, pimento, &c. Sinapisms were used with advantage; applied largely and at the proper time, they induce an active and durable excitement. For the same object, we use plasters of cantharides, simple or with the oil of turpentine, concentrated mineral acids, and boiling water. This last is preferable to all other topical applications in desperate cases.

Practitioners have not hesitated to extol the use of emetics in Cholera; but they have now been abandoned by those even who were the first to recommend them. The combination of emetic substances with opium has been advised. James' powder on some accounts seems preferable. The action of sudorifics has been highly spoken of. Purgatives have been employed, such as the infusion of senna with gentian, ginger or cardomom, or with the tincture of one of these substances, the tincture of aloes, of myrrh and benzoin, called the bitter drug, the different cathartic extracts, in a word, all the bitter and carminative purgatives, accompanied or preceded by a moderate dose of calomel. Castor oil has been given in the dose of half an ounce mixed with fifteen or twenty drops of laudanum. The oil of turpentine has also been prescribed, but less frequently.

Lavements with opium or with oil of turpentine have been administered.

Magnesia mixed with milk seems to have been attended with some advantage.

The inhalation of sulphuric ether has been tried; that of oxygen gas, nitrous acid, the employment of galvanism and electricity have been recommended rather than practised.

Drinks and diluents have been almost universally regarded as inadmissible, because, it is said, the stomach refuses to retain them, and it is necessary to avoid every thing, which would tend to excite or renew the irritation of this organ. How happens it that no attention is paid to that distressing sensation of thirst, which constitutes one of the principal and most afflicting symptoms of this disease? The patients ask particularly for cold drinks; and all physicians, without exception, have decided that they were extremely dangerous, and almost always mortal. The liberal use of diluents is indicated by the ardent thirst which prevails, and by the great abundance of the evacuations. We should be

careful not to give a large quantity of drink at one time. Experience has demonstrated that we may prescribe with perfect security acidulated, vegetable or mineral drinks.

We may give the names of diluents and emollients, to decoctions of barley, rice, sago, arrow-root, chicken water, and beef tea.

When we administer wine or spirits, it will be proper to mix them with diluting drinks, especially with arrow-root or sago. To the Indians we may give simple rice water, or a weak decoction of pepper.

We may begin to allow nourishment as soon as the disease seems to yield, and when the functions are about to re-establish themselves. We should prescribe soups, jellies of meat, farinacious and mucilaginous substances. The quantity should be moderate and not repeated too frequently. However, when there are evident signs of febrile re-action or of an inflammatory excitement after Cholera, the diet should be regulated in consequence.

The patients must, as far possible, avoid any action of the voluntary muscles.

M. Scott recommends that the frictions should not be made with too much force, and that the patients should have the air as often as they demand it.

At Batavia, according to M. Vos, one proposed blood letting, another calomel, and a third excitants combined with opium. Some Europeans, of strong constitution, sick but for a short time, appeared to be benefitted by blood-letting, but in general it did not succeed. Blisters and sinapisms were applied to the bas-ventre, but the disease increased. Fomentations were without efficacy. The warm bath produced a happy effect as long as the patient continued in it. As soon as he left it, the symptoms re-appeared, and the prostration became more evident. Spirituous frictions, additional covering, and the application of warm sand, were among the best means of recalling the animal heat. Opium and calomel given from the commencement, proved efficacious; and, when the patient had arrived at the third or fourth day of his disease, purgatives were administered, which were not always without danger; at the same time he was sustained by a small quantity of wine, broth, and sago.

M. Gravier, at the commencement, prescribed rice water, slightly acidulated, together with lavements of the same liquid. These means frequently sufficed to quiet the vomiting and stools. When the symptoms became more intense, and indicated an inflammation of the digestive mucous membrane, he had recourse to blood-letting. This physician did not employ leeches. He confined his patients, the first day, to an absolute diet. When a change

for the better took place, and as soon as the symptoms disappeared, he prescribed cream of rice. The patients, thus treated, were usually convalescent on the second day, and in a condition to take nourishment, and on the fourth day, they were restored to health. When a favorable change occurred, their appetite became voracious; and in those instances in which their desire for food was gratified, the symptoms were renewed with great intensity; the resources of our art then became unavailing, and the patients died in the midst of the most agonizing torture.

In some desperate cases treated by M. Deville, the liquid laudanum proved very effectual. He gave it with great advantage, in conjunction with sulphuric ether, or administered this latter article alone, in a dose of from fifty to sixty drops in half a glass of water. In a few minutes the patients were restored to health. Success was almost certain, whenever the physician was called a short time after the invasion of the disease; but the effects were so prompt that ten minutes sufficed to produce death.

M. Quesnel states that, during the attack of Cholera in the isle of France, recourse was immediately had to the alcoholic preparation known by the name of the bitter drug; it was, however, soon abandoned. The physicians afterwards employed laudanum, emollient drinks, lavements of the decoction of flax seed, warm baths, emollient fomentations to the abdomen, frictions with camphorated alcohol and the ammoniacal liniment, blisters to the legs, and the application of boiling water to those parts; then followed the pretended specifics. M. Margeot ordered, every two hours, two drachms of the sulphate of soda, in a glass of honey and water, until the evacuations became bilious; every quarter of an hour this beverage was renewed, and was carried as far as twelve doses, sometimes more; its action was favored by a weak infusion of the *aya-pana*, and emollient lavements. M. Robert conjoined an ammoniacal potion with this treatment. M. Galdemar prescribed another composed of olive oil, camphor and ether. Others administered water in which hot ashes had been thrown. Some even went so far as to administer an emetic in the dose of from four to six grains in a bottle of water, half a glass being given every fifteen minutes. The treatment adopted by M. Quesnel consisted in the administration of a large dose of laudanum in a small quantity of the infusion of linden or orange flowers at the commencement of the disease; afterwards emollient drinks and lavements; and finally, he endeavored to produce a removal of the irritation fixed in the digestive tube, by means of the most active revulsives, at the same time that he applied to the abdomen fomentations composed of the decoction of flax

seed and poppy heads. Persuaded of the good effects of blood-letting, he had recourse to it several times; but the almost absolute suspension of the circulation required great caution in the abstraction of blood, in order for it to be followed by any advantage.

M. Keraudren highly disapproves of evacuants in the treatment of Cholera, particularly emetics, and even ipecacuanha. He mentions the good effects obtained by M. M. Deville and Saint-Yves from the use of ether and opium. Bleeding he observes should not be practised until, re-action having produced a warmth in the circumference of the body, the respiratory organs and sanguineous system begin to revive. Emollients and antispasmodics should be administered at first, and if these be followed by success, it will be unnecessary to employ any other treatment. If they produce no good result, they must be discontinued, and recourse should then be had to diluents, antiphlogistics, and revulsives. Drink should not be refused to the patient; they are to be given at the same time with the antispasmodics. These last should be selected among the diffusibles, especially the liquor of Hoffman or sulphuric ether. The physicians of Manilla combine camphor and opium—the first in a dose of four grains, the second, or rather the laudanum, in that of eighty drops, in an ounce of the rectified spirits of wine, the whole mixed in an equal quantity of boiling water; this is to be taken at one time, and repeated every six hours until a diminution of the principal symptoms. When the patients are very much enfeebled, but half of this dose is to be given every three hours. M. Keraudren considers the camphor superfluous, if not dangerous; and the dose of laudanum appears to him too large. After giving a few doses of ether, if the patient does not experience some benefit, an opiate preparation, such as laudanum, is associated with it. The aqueous solution of the extract of opium, in a mucilaginous liquid, is preferable. The opium of Rousseau is still more advantageous. Among the external applications, baths at 30 or 32 degrees, in which a large quantity of marine salt is dissolved, appear to have inspired some confidence. Dry frictions, styptic pediluvia, sinapisms, blisters, the direct application of boiling water, and the actual cautery, are the general revulsives which were employed. Emollients, antispasmodics, and narcotics are indicated against the spasmodic symptoms. These remedies have been administered successfully by M. M. Huet and Lefèvre aboard the *Cybèle* and *Cleopatra*.

When the symptoms are no longer essentially nervous, and the epigastrium and abdomen continue painful and tense, we

may presume that there exists a consecutive inflammation of the gastro-intestinal mucous membrane; this inflammatory disposition must be combatted by diluting, nitrous and acidulated drinks; emollient applications to the abdomen, leeches and cupping glasses on the parts near the pain; general bleeding is not admissible. Sinapisms to the feet, blisters to the legs and thighs, escharrotics, such as nitric acid, and cauterization by fire are also indicated in this case.

Warm baths may be used in the treatment of Cholera. When worms pass from the patients, it is proper to combine calomel with the purgatives, which we may consider useful, when the inflammatory symptoms have subsided.

According to Fraser, it is usual, in Persia, to wash the sick with cold water, and give them *verjuice* for drink. Sir J. Cormic administered, at the commencement, calomel and opium separately or combined, and when the disease was more advanced, he gave purgatives. In many cases, strong purgatives were required every five or six hours, for two or three days. He found great success attending the application of linen dipped in warm water, and placed on the arms and legs. At Bassora, M. Morlando applied refrigerants to the parts affected at the moment of the invasion; to this, he united general and local blood-letting. At Bagdad, M. Meunier treated the sick by bleeding from the arms, the application of leeches to the hollow of the stomach, the use of mucilaginous drinks in small quantity, and opiates in potions and lavements. The physicians of Syria employed blood-letting, the decoction of mint, fomentations to the abdomen of warm vinegar, and abundant drinks with the juice of the pomegranate. In Mesopotamia, leg baths, and bleeding in both arms were recommended. At Alep, M. Salinas prescribed acids, the juice of lemon and sour pomegranate, combined with the infusion of mint. Treacle was used in the East. At Moussol, the Monk Sigismond ordered acids, and the tincture of laudanum. At Erzèroum, the Cholera was treated by the same remedies that are employed against colic. On the coast of Syria, the physicians prescribed the decoction of mint with the juice of pomegranate, the decoction of willow leaves with vinegar, emollient fomentations to the abdomen, the application of ice water or vinegar, the moxa and cupping glasses to the abdomen.

At Tèflis, the mode of treatment adopted by the English physicians in India was recommended and employed by M. David Makertienne. M. Martinengo, on the contrary, condemned the use of excitants; he preferred mucilaginous, gummy, oily drinks, warm baths, anodyne lavements, blood-letting, and the

application of leeches. He approved of opium when the nervous excitement was very much increased; and employed calomel only at the commencement of the disease, and when irritation did not prevail.

The Russian Committee, assembled at Astrakan, in 1823, prescribed the following treatment:—Copious blood-letting; calomel combined with sugar and gum arabic in powder; a potion composed of from forty to sixty drops of laudanum, twenty drops of the oil of peppermint, two ounces of distilled balm-water; ammoniacal frictions on the stomach; cupping glasses to the abdomen; friction of the whole body with simple or camphorated alcohol; mucilaginous lavements with thirty drops of laudanum; and from ten to twenty grains of calomel. When the symptoms continued, the use of these medicines was renewed, experience having demonstrated the danger of only a few hours delay, and of allowing the cramps to commence before the remedies took effect.*

This mode of treatment, predicated on that of the English physicians, was likewise employed when the Cholera appeared in the Russian Empire, in 1830. Blood-letting did not prove of much advantage; sudorifics were very much extolled; recourse was had to very large cataplasms, placed burning on the chest and abdomen; the patients were enveloped in linen dipped in boiling water. In order to second the action of these remedies, brandy was administered for drink.

When the Cholera appeared in Poland, the committee on health at Varsovie, indicated the following as preferable to all other remedies:—

At the commencement, bleeding from the arm, calomel in the dose of from one to six grains with powdered opium, a quarter of a grain to two grains every two, three or four hours; mucilaginous infusions, afterwards a weak infusion of mint; dry friction on the whole of the body. When the pulse becomes weak and almost insensible, cupping glasses to the chest and abdomen; frictions with the tincture of cantharides and pimento, abstraction of a few ounces of blood; application of a hot iron to the extremities; sinapisms and blisters.

M. Searle prescribed six grains of calomel every half hour, and warm drinks with a few spoonsful of rum; afterwards he undoubtedly changed his opinion, for he administered a soup-spoon of kitchen salt in a glass of cold water, and a second dose after six minutes. At a later period, he gave twelve grains of calomel every two hours. He also prescribed general bleeding in all cases;

* Moreau de Jonnés, *op. cit.* p. 55–60.

and those remedies which are supposed to possess the faculty of lighting up fever, were all employed. Calomel and cordials were combined with a spoonful of brandy, and the whole was put into two spoonsful of warm water. The patient made use of the decoction of *salep*.

M. Leo gave the sub-nitrate of bismuth in the dose of three or four grains, every two hours and even oftener.

Ammonia was administered in the dose of five or six drops in a solution of gum, every hour. Ipecacuanha was employed in purgative doses; camphor, castor and musk, were also prescribed; phosphorus, it is said, was injected into the veins.

M. Bernsztayn gave the tincture of opium in warm water, applied leeches to the neck, and refrigerants to the head; he ordered black coffee to be taken, and when it caused constipation, he prescribed lavements of cammomile; and also administered internally a mixture of soap and honey, and the aqueous tincture of rhubarb. These means not having succeeded, he renounced them and prescribed warm water in the dose of an eighth or quarter of a pint every fifteen minutes; fifteen to eighty such doses procured the most decided relief. Frictions were also made with flannel wet with warm spirits of wine; when the heat was established, and there was an appearance of congestion, blood-letting and leeches were had recourse to; constipation was combatted by means of rhubarb.

M. Janikowski abstracted a large quantity of blood at the commencement, when the subject was plethoric, or offered signs of congestion; he then gave, every three hours, two grains of calomel with a grain of opium; during the intervals, the patient took every quarter of an hour, a glass of warm water or an infusion of mint. Sinapisms were applied to the hollow of the stomach, and the limbs rubbed with dry flannel or camphorated brandy. If, at the end of twenty-four hours, the cramps and vomitings ceased, diarrhea alone continued, the tongue became coated and yellowish, without being dry, he gave the aqueous tincture of rhubarb, mint water with syrup, and mucilaginous drinks; the alvine discharges assumed a greenish, yellowish taint, afterwards the aspect of ordinary diarrhea, and the patient almost always recovered. When the amelioration was slow, he administered half a grain of nux vomica in a spoonful of an emollient decoction every four hours. If the tongue became dry without being coated, the belly gaseous and sensible to the touch, the pulse accelerated, the thirst great, no alvine evacuations, or in small quantity, the intellectual faculties obscured, sensation obtused and the motion feeble, he discontinued the use of calomel,

and recurred to antiphlogistics and emollients, but almost always in vain. Blood-letting sometimes succeeded in arresting the disease on the first day.*

M. Koehler often recommended bleeding; he more particularly employed liquid ammonia in the dose of one drop in a spoonful of water every hour, for children, and from four to six drops for adults. He prescribed warm water, without sanguineous emissions, when the body was very cold; in the sixth glass he put from four to six drops of laudanum, and successively for fifteen. In cases of slight Cholera, warm water, the potion of Rivière and the tincture of rhubarb soon effected a cure.

M. Lebrun is of opinion that blood-letting is indispensable; after it, he administered very warm water every fifteen minutes, and to every fifth or sixth glass he added five or six drops of laudanum; he gave six grains of camphor combined with calomel; when the diarrhea had ceased, he merely prescribed the tincture of rhubarb.

M. Enoch bled the majority of his patients, and prescribed two grains of calomel with a quarter of a grain of opium; if the tongue became yellow, he associated calomel with rhubarb, and seconded their action by lavements; he ordered sinapisms to the stomach and extremities, and gave fifteen drops of the tincture of opium.

M. Jasinski, at the commencement of the epidemic, prescribed three grains of calomel and a grain of opium; blood-letting was had recourse to when it appeared to be indicated, and leeches were applied to the painful point of the epigastrium. Finally, he gave the tisan of valerian; at a later period he adopted the treatment of M. Leo.

M. Kaczkowski recognized three varieties of Cholera. In the first, the symptoms indicate inflammation of the stomach and intestines:—copious blood-letting, three or four grains of calomel with half a grain of opium every half hour, blister to the abdomen, sinapisms, cataplasms of horse-radish, and moxas of blotting paper dipped in the spirits of wine. In the second or rheumatism caused by a species of cold; Dover's powder, decoction of *salep*, and an extensive blister to the hollow of the stomach. In the third or gastric variety, antiphlogistic remedies, and a spoonful of the carbonate of magnesia every two hours; half a drachm of the tincture of opium in six ounces of the decoction of *salep;* infusion of mint; three grains of the extract of nux vomica; four ounces of distilled water; half an ounce of the mucilage of gum

* Brierre de Boismont, *Relation du Cholera Morbus*, and *de Pologne*, Paris, 1831.

arabic; and two drachms of white sugar, a spoonful to be taken every half hour.

M. Lessel prescribed ipecacuanha with success, when Cholera was accompanied by constipation.

The hydrocyanate of zinc, oxyginated water, and oxygen gas have been employed with advantage.

If now we examine these different modes of treatment, these various medicines and prescriptions, we shall observe that the treatment of sporadic Cholera Morbus, or of that which affects but a small number of persons, is very successful, whilst it seems altogether unavailing against the epidemic Cholera, which attacks many individuals of the same country. In a word, what can we say in favor of remedies in despite of which more than half of the patients have perished? This has absolutely occurred in relation to Cholera Morbus, in the majority of places in which it has prevailed. If medicine has never proved more efficacious, certainly it would not have preserved the confidence which it inspired at the commencement of its institution. Such extraordinary mortality tends to repel every medicine, if not as injurious, at least as useless, according to every probable calculation. Let us say more —among the methods of treatment just described, there are some, which must have aggravated the ravages of the disease. Without stopping to demonstrate the manifest truth of this proposition, let us examine what part each organ has taken in the modifications induced with a view of obtaining a cure.

Digestive Organs.—Cold, warm, hot water; oil; infusions, animal, aromatic, bitter, acid decoctions; emollient, refrigerating, acid syrups; vinous water; wine; aromatic wine; opium; potion of Revière; ether; ammonia; camphor; calomel; hellebore; emetics, ipecacuanha; mild purgatives; drastics; henbane; astringent fruits; bouillie; milk; milk with the syrup of poppies; acetic hydromel; and drink mixed with carbonic acid.

Respiratory Organs.—Acid, aromatic vapors; chloride of lime; oxygen.

Circulatory Organs.—Blood-letting; leeches; phosphorus.

Organs of Sense.—Woollen clothes worn next to the skin; warm baths; vapor baths; emollient fomentations; mucilaginous, alcoholic, narcotic, and emetic cataplasms; oily, and aromatic embrocations; hydrocyanic, ethereal liniments, with belladona and quinine; frictions with vinegar, alcohol, camphorated wine, and concentrated acids; rubefacients; cupping glasses; sinapisms; blisters; sulphur; camphorated and emetic plasters; boiling water, moxa; and actual cautery.

Organs of Locomotion.—Repose; frictions; acupuncture.

Mind.—Consolation ; confidence ; perfect repose.

We perceive from this table that the greater number of therapeutic agents have been employed against the Cholera Morbus. We will not say in virtue of what theories, for these, generally speaking, were so erroneous, that even when their advocates acted properly, they reasoned badly.

To arrest the evacuations, or to make them assume the bilious character ; to produce a cessation of the spasms ; to modify, expel, and solicit the bile ; to change the state of the digestive organs ; to fortify, regulate, and control the nervous system, such are the complex and multiplied objects, which have been proposed.

Among practitioners, some have been prodigal of narcotics ; others of sanguineous emissions ; with several, antispasmodics were preferable ; with others, tonics and stimulants were all-powerful. Some practitioners have been content to follow, as nearly as possible, the indications presented by the symptoms, and these have not been the least reasonable. There is not a physician who, having been called upon to treat Cholera, especially epidemic, who has not considered it his duty to create some mode of treatment capable of immortalizing his name. The least rational are those, who have employed simultaneously, several modes of treatment founded on no solid basis.

Let us remark, in the first place, that, if it is admissible in a formidable disease, to act vigorously on the skin, such treatment would be attended by fatal consequences, if applied to the digestive passages, and that these two orders of organs should be treated in a different though analogous manner. There is no danger in stimulating, irritating, inflaming, or even mortifying the skin in Cholera, for the lesion is inconsiderable compared with that which it is intended to combat ; at least there is no danger as long as re-action does not manifest itself, and it is very rarely obtained by the employment of the most energetic remedies.

On the contrary, to produce an irritation of the digestive passages would be altogether contrary to the state of those parts, no matter in what manner they may be affected. When irritated or inflamed, if we apply irritants to them, in the hope of provoking an action from the centre to the circumference, we may succeed in a small number of cases ; but much more frequently we will only aggravate the evil, which it was our intention to remedy.

As regards the circulatory system, certain physicians have imagined it sufficient to evacuate it in order to cure the Cholera ; others have endeavored to accelerate the circulation. These general views have been more injurious than useful.

We can scarcely effect the respiratory organs, except by acting on the circulation, the digestive surface and skin. The medications, applied directly to the respiratory system, have not produced the good which was expected from them.

The organs of locomotion are affected in a secondary manner; we should, therefore, act on the nervous extremities of the skin or digestive passages, when we wish to restore them to their natural condition. The mind being but little deranged in Cholera, it is unnecessary to attend to it, except when the patient maifests great anxiety in reference to his situation.

As regards the different therapeutic agents, which have been applied to the external or internal organs, we may assert that not one of them has presented the virtues on account of which, certain substances, employed in particular affections, have received the name of *specific*. In a word, none of these remedies have cured a majority of patients placed in different circumstances, and in despite of the peculiarities which each individual may have presented.

If we wish to attend to the lessons of experience, we must renounce the hope of finding in our hygienic, surgical, and pharmaceutical remedies, a specific against Cholera. It remains, consequently, for us to mention the particular cases in which one remedy is indicated in preference to another.

Let it be remembered that we consider Cholera Morbus an irritation, at first nervous, afterwards secretory, and sometimes inflammatory, of the stomach and intestines, especially of the large, characterized by abundant and repeated evacuations above and below, and in the course of which the circulatory and respiratory systems become gorged with black blood, in their venous portions, as also the brain and spinal marrow.*

Let us also recall to mind our division of Cholera into mild, dangerous, and mortal;† alimentary, bilious, mucous, serous, nervous, tetanic, convulsive, inflammatory and typhoid.‡

a. The mild Cholera, caused by indigestible, nauseous or acrid aliments, too abundant or substantial; by insipid, sour or alcoholic drinks; by an emotion, intellectual labor, during or soon after a repast; determined, in a word, by local causes peculiar to the individual who is affected by it, scarcely requires the interference of art; its duration is short, and its termination ordinarily favorable even when no remedy has been employed. But this is not always the case; when the vomiting and dejections are repeated at the time that the spasmodic symptoms occur, we

* Page 154. † Page 78. ‡ Page 154.

should attend to the patient, not that there is always danger, but because in reality there may be, and also because we should abridge the duration of suffering, in order to prevent too much subsequent debility. Seven different cases may present themselves:—1st, we may be called upon when there is nothing more than pain; 2d, or at most, nausea; 3d, or when vomiting has occurred; 4th, the dejections have commenced; 5th, or the aliments in their integrity, or but half digested may be rendered at the moment in which we are called; 6th, or they may have been already evacuated, and the patient not vomit any thing but mucosities or bile when we visit him for the first time; 7th, or in fine the evacuations upwards and downwards have ceased. In the first case, the abdomen should be covered with warm cloths; and we should prescribe an aqueous, aromatic, weak infusion, sweet or acidulated, according to the taste of the patient; it should be very warm, and given in spoonsful; lavements of a mucilaginous decoction.

In the second, the same remedies are to be employed, with the exception of the drink.

In the third, we must also suppress the drink, insist on the lavements, and render them more active by the addition of oil, manna or salts.

In the fourth, the lavements must be increased, but only mucilaginous.

In the fifth, we must favor the vomiting of alimentary matter by means of warm water.

In the sixth, the drink must be suppressed; warm topical applications; emollient fomentations and mucilaginous cataplasms are to be substituted for the warm cloths.

In the seventh, we must administer warm gummy drinks in small quantity, and prescribe the same cataplasms and fomentations.

Repose, confinement to bed, and rigid diet are absolutely indicated.

If nervous symptoms should ensue or persist after the vomiting and dejections have ceased, we should prescribe rubefacient pediluvia with the flowers of mustard, and if the symptoms increase, apply sinapisms to the legs.

All this being accomplished in the space of a few hours, it would be superfluous to do more. The Cholera of which we have just mentioned is sometimes intense, and then it is treated by the use of different medicines; we soon persuade ourselves that some great danger has been averted, when it sometimes happens

that we have done nothing more than would have been accomplished without the aid of art.

Such appears to us to be the treatment of the mild, nervous, or alimentary Cholera.

After this form of Cholera has terminated, vomiting and even obstinate dejections of bile, mucus, or serum, sometimes continue. In this case, the pulse is either but little altered, or it becomes accelerated and increases in volume. In the first case the warm or hot bath, according to the susceptibility of the individual, is indicated. If there is bile in the evacuations, we should give cold water, accidulated, and moderately sweet, in small doses. If the evacuations continue, we should not hesitate to apply fifteen, twenty, or thirty leeches to the epigastrium.

Should the patient be plethoric, it will be necessary to abstract a quantity of blood without delay.

b. The Cholera *gravis*, that which is accompanied by vomiting and dejections—followed by mucous and serous evacuations, when all the food and drinks have been expelled—complicated or followed by strongly marked nervous systems endangering the life of the patient—in a word, whether it be sporadic or epidemic, it requires a more active treatment than the majority of the preceding cases. The circulation is, at times, accelerated or oppressed ; sometimes, it differs but little from its ordinary condition. The nervous symptoms are, sometimes, spasmodic, convulsive or tetanic : sometimes on the contrary stupor is manifested.

The remedies pointed out above are applicable to these different cases ; but there is something more to do. If there is no manifest symptom of gastro-intestinal irritation ; if the tongue is neither red on its borders, nor dry ; if the epigastric region is not painful on pressure, we should substitute cataplasms of flaxseed, sprinkled with the solution of the gummy extract of opium, in the place of the warm cloths and fomentations. If the cataplasms should become inconvenient by their weight, they may be replaced by mucilaginous and narcotic fomentations. We should never endeavor to produce a direct cessation of the dejections ; the lavements should be continued if the state of the intestines will allow their introduction. If the patient is well constituted and vigorous, and the skin is not different from usual, except as regards its paleness, blood-letting may be had recourse to. The indications will be the same as regards the matter evacuated either through the stomach or intestines.

Here arises the question in reference to the administration of opium. Shall we adopt the opinion of Sydenham, who recom-

mended that we should not employ narcotics until after the evacuations had ceased, or, after the example of the more modern English, shall we employ it immediately? If an amelioration should have been affected by the excitants applied to the skin, and the blood letting in connection with the drinks and lavements, we should abstain from opium. The hands are to be enveloped in warm cloths, if they should become cold, and the feet plunged into warm water rendered styptic, if all the alimentary matter has been evacuated; if the surface of the skin is chilled, it will be proper to wash it with warm water in conjunction with vinegar or alcohol, or even the patient may be put into a bath. If, notwithstanding these remedies, the evacuations persist without the patient feeling any pain in the abdomen on pressure, and if they are composed merely of mucosity or serum; if the convulsive or tetanic symptoms prevail, it will be necessary to give a grain of opium in a spoonful of a warm and sweetened infusion of orange leaves, every hour. Opiate lavements must never be administered.

In the varieties of Cholera just mentioned, if the thirst is very acute and the skin heated, we may prescribe cold drinks; they must be given warm if the skin has a tendency to chill; hot, if the surface of the body has lost its warmth; but always in small quantities, no matter what their temperature may be.

I am of opinion that we should never employ narcotics in lavement, because there necessarily will be an inconvenience in suppressing the stools, whilst the vomiting continues—it is this latter that we should more especially endeavor to arrest, for it is entirely opposed to the normal state.

In the second variety of Cholera which has occupied our attention, I cannot perceive any satisfactory reason for prescribing calomel. There is no doubt that the abuse of this medicine has proved extremely injurious. There is even no foundation for its use. Why prescribe an evacuant against an evacuation? Is it to give the alvine dejections an ascendency over the vomiting? But the stomach is the first organ to receive the impression of the the medicament, if it be taken by the mouth; and we can scarcely believe that the presence of calomel has no effect on this viscus, since the portions of intestine in which it is found are sometimes inflamed. Something has been said about the necessity of inviting the bile to the intestine, because an amelioration is sometimes manifested after the mixture of this fluid with the alimentary matter—but can this be effected without irritating the duodenum, in a patient laboring ordinarily under excessive thirst? Notwithstanding all that has been urged in order to justify the employment of calomel in Cholera, even a mode-

rate use of it appears to me to be purely empirical; and the bills of mortality demonstrate without reply that but very little advantage has been derived from this medicine.

I do not, therefore, hesitate to declare that the administration of calomel, in the disease of which we are treating, is based upon no scientific principle, nor is it sanctioned by experience.

The time has now passed when it was thought necessary to prescribe ipecacuanha against vomiting and diarrhea. Why, therefore, continue to administer a purgative in Cholera?

I admit that the digestive passages are not always inflamed in this disease, but their irritation is very evident, and this is so true, that opium itself is frequently rejected, which proves that its use was premature.

We, also condemn the employment of ether and ammonia, unless the dose of these medicines be so small, that the water, which serves as a vehicle to them, merely preserves, as it were, their aroma. The use of vegetables, orange leaves, tea, and flowers of linden, appears to me altogether preferable; for when the infusion is weak, the excitement it produces is slight and temporary; it can have no other effect than to combat the disposition to nausea which, as we know, sometimes ceases, as by enchantment, after the slightest stimulus.

If, on the contrary, there is prostration or stupor, we should abstain from opiates and internal excitants, and apply sinapisms to the inferior extremities. The drink is to be the same. These sinapisms are to be renewed, and placed upon different points, if this be necessary, in proportion to the continuance of the stupor. When stupor declares itself, or only a profound weakness—which is not the same thing—we must examine whether this diminution of intellectual activity, or of locomotive power, arises from a congestion of the brain or spinal marrow, or from the developement of a manifest or latent inflammation of the digestive passages. With a view to ascertain this, we must refer to what has been written in the books of a recent date. I may be permitted, I hope, on this occasion to cite my own, not as models, but because they are connected with this subject.*

In the case of congested brain, we must open the veins of the foot or arm, or the vessels of the anus by means of leeches. On

* *Pyrétologie physiologique; nosographie organique.* See particularly the researches of Professor Lallemand *on the brain* and the *Treatise on encephalitis* by Professor Bouillaud. The elevated and extended views of Professor Broussais, in reference to the inflammation produced in the nervous system by the irritation of the digestive passages, are likewise applicable in this place. See the *Examen*, 3d, edition, and the *propositions de pathologie.*

the contrary, if the inflammation manifests itself in the digestive passages, the leeches are to be applied to the epigastrium.

We do not wish to depreciate the frequency of inflammation in Cholera Morbus, nor to give it more importance than it merits; but it cannot be denied that cadaveric dissections have demonstrated traces of it sufficiently evident to apprize us of the necessity of removing with care every thing that would be likely to promote its developement.

c. Under the name of mortal Cholera, we have comprehended that particular form of it in which, from the commencement, we have every reason to apprehend death. It manifests itself in two ways. It sometimes declares itself by all the phenomena characterising this malady; the symptoms increase rapidly, and the most alarming acquire an extreme intensity; the extremities become cold, painful cramps are experienced, the limbs are almost in a passive condition, the pulse is extremely small and feeble; the countenance is altered, sharpened, and depicts decrepitude. Sometimes, these same symptoms, if they do not appear precisely the first, manifest themselves at the same time with the evacuations, so that death, as it were, occurs simultaneously with the disease. Sometimes even, it is said, the phenomena of approaching death are declared, when the local symptoms have scarcely had time to develope themselves.

In this latter case what is to be done, and what are we to hope from any remedy we may employ? Plunge the patient into a warm bath, rendered styptic; when taken from the bath, dry the skin with warm cloths, then rub it with coarse flannel, and afterwards with a soft brush; put sinapisms to the feet; rub the calves of the legs with ammoniacal liniment; cover the abdomen with a plaster or cataplasm, sprinkled with several grains of tartar emetic. This is all that can be done. We must, before every thing else, excite the organic action either by stimulating the skin, or by drawing the internal irritation towards it. If these means succeed in exciting the patient, and determine re-action, it may then be useful to practise blood-letting; it will be unnecessary to make it very copious, if the other means have already affected an amelioration. If, however, considerable re-action declares itself, it will then be proper to abstract a large quantity of blood. Certainly, this is not a proper case for the employment of opium. Calomel, whose action is generally so slow, cannot exert any influence over a disease so rapidly fatal. The drinks should be warm and slightly aromatic, until the patient desires them to be changed.

When the symptoms, announcing the evacuations and spasms,

appear simultaneously with the phenomena of death, we must necessarily attend to the latter as well as the former; and we should proceed with attention, judgment, and devotion. As soon as re-action begins to appear, it should be fortified by warm aromatic drinks, and by rubefacients or blisters.

In fine, in those cases in which hurried, repeated, and copious evacuations are immediately accompanied by violent convulsions in an individual threatened with death, it will be necessary, almost at the same time that we heat, and stimulate the skin by the most powerful and efficacious remedies, to abstract blood from a vein, and also administer opium in warm or cold gum water, in proportion as the skin is cold or already heated.

Boiling water may be advantageously employed in those cases in which life is suddenly threatened. It would likewise be proper to have recourse to moxas of cotton or blotting paper dipped in alcohol. Perhaps, it has been wrong, in a similar case, not to use the actual cautery, at least when every thing seems to fail in producing the slightest re-action.

Such appears to us to be the treatment of Cholera in its different forms. Thus employed, it consists of warm or cold, aromatic, ethereal drinks; blood-letting, leeches, opium; warm mucilaginous, narcotic applications; rubefacients, blisters and escharrotics. The whole *polypharmacie* has disappeared. No advantageous remedy has been neglected, but every thing susceptible of doing harm has been banished from this collection of medical agents.

This plan of treatment offers every thing that is useful in those, which have been presented to the reader. I have done nothing more than omit the superfluous, empirical, and injurious remedies. In conforming to our mode of treatment, will we be enabled to save more lives than in following any of the various directions, which we have just passed in review? Experience alone can solve this question. Let us, however, remember that a judicious practitioner would disdain employing always the same remedy, no matter what it might be, against a disease, which presents different, though analagous characters; that it is not sufficient to have recourse to several different medicines, but that it is necessary to appropriate their use to the different varieties and periods of the disease; that, the mortality having been generally more than one half, there is reason to fear that the enormous doses of laudanum, calomel, and pure alcohol have more than once added to the danger of the disease; and that the physicians, who have been most successful in this malady, employed blood-letting and warm water, and were reserved in the use of the other remedies.

The rapid progress of Cholera Morbus, the promptitude with which it attains its greatest degree of intensity, and even death, renders it very evident that any treatment, which does not take effect from the commencement, will almost always prove inefficient. There is no other disease in which we are called upon to decide more promptly in reference to the medicines, which are to be preferred. Unfortunately, these remedies are not always at hand.

When we have succeeded in establishing re-action, if this is lasting—and it is important to maintain it—although the evacuations should continue, there is hope of saving the patient, notwithstanding that he may frequently succumb in consequence of a new loss of external power, announcing the return of internal irritation. If re-action continues, we have nothing to do but follow the indications of the symptoms. At other times, a dangerous gastro-enterite declares itself, and should be treated by abstinence, emollient drinks, topical applications of the same nature, and local sanguineous emissions. If there should be encephalitis or inflammation of the spinal marrow, the anti-phlogistic remedies are to be directed towards the brain and spine; we should avoid giving pain, and in effecting a revulsion we should solicit interiorly natural evacuations, and exteriorly rubefaction.

Writers have spoken of a bilious saburral state appearing during convalescence; and, in fine, the tongue, until then clean, may become coated after the evacuations have ceased. This also sometimes happens, after purging, particularly when it has been too violent or ill-timed. We must avoid purging, even gently, as Geoffrey was in the habit of doing, if we do not wish to see, as was his misfortune, the symptoms re-appear.

During convalescence, baths are useful; it is not necessary to remain in them a long time, and it is useless to remark that they should not be employed by persons who, after their disease, have œdema of the inferior extremities.

As regards the regimen, the patient may gradually return to such as he was accustomed to before his sickness, being particular to avoid every thing that could favor, hasten, or determine the developement of the disease, and consequently provoke its return. The patient will find it advantageous to make use of light brush frictions every day on his skin; and in future he should wear flannel over the whole surface of his body, and not merely on the thorax, as is generally done, thus leaving the loins and bas-ventre exposed to the cold, from which it was thought necessary to preserve the chest.

CHAPTER VIII.

MEANS TO BE ADOPTED BY INDIVIDUALS IN ORDER TO AVOID CHOLERA MORBUS.

CAN we avoid contracting this disease when it prevails among us? By this question do we seek an *infallible* means of preserving ourselves individually from this scourge? Most certainly not; and we cannot but be astonished at the ridiculous credulity of individuals, who at the present day lavish gold on empirics for the purpose of having their imagination, already diseased, quieted. Far more fortunate is he who succeeds in preserving his mind free from the distressing fear of death: in epidemics as in war, death has appeared more than once to have respected courage.

There is no *specific* for the cure of Cholera Morbus, neither is there any by which it may be prevented.* But there are certain precautions, which experience and reason agree in recommending, because, by conforming to them, we really diminish the unfavorable chances.

Let us remember, in the first place, that an epidemic which travels over a great extent of country, and proves very fatal, is not the production of an accidental cause, but really the effect of the successive and often long-continued action of different causes, whose principal seat is in the atmosphere. What is to be done against these accumulated circumstances of long standing? Frequently their influence is felt before individuals think of adopting any precautionary rules. In this respect, there is no mode by which the Cholera may be avoided. Among the atmospheric causes of Cholera, there are some that cannot be avoided, besides those we have just mentioned—thus intense heat and dryness are without remedies. We must not seek the cool air with too much eagerness; for in warm countries and seasons, it is precisely this that is the most frequent cause of the diseases which are observed to occur. Humidity should be controlled as much as possible, by heating the apartments, and wearing woollen clothes next to the skin. A woollen band covering the loins and bas-ventre is evidently useful. This may be replaced by a flannel jacket very long be-

* Ignorance and empiricism announced the chloride of sodium as a *specific* preservative against Cholera Morbus. Experience has demonstrated that it is not so; and this agent deserves no other name than that of disinfecting.

fore and behind. The soles of the feet should be well protected from the damp; there is not a more fruitful cause of diarrhea than this. The coldness of the air is likewise easily opposed by the same means. It would be adviseable for an individual to cover himself from head to foot with flannel, even during the night,* in order to avoid the immediate action of the cold when getting up in the morning.

The vicissitudes of the atmosphere are not among the number of circumstances, which it is the privilege of art to avoid; we preserve ourselves from their influence by being secluded from them, and confining ourselves in the air of apartments, but these last must be well aired. The difficulty of preserving one's self from the atmospheric conditions in general, the impossibility of so doing in a multitude of cases, will explain, in a great measure, why, notwithstanding the most rigid temperance, we can not always avoid the Cholera.

Such is not the case as regards the regimen. We may, in general, avoid the use and particularly the excess of those aliments and drinks, which we have indicated as susceptible of provoking or favoring Cholera. Poverty itself is not an insurmountable obstacle to the choice of aliments; among the most common, we may prefer the least injurious; such as green vegetables. Potatoes are not proper except when they are cooked without water. Fruits are not bad from their nature, but those which are unripe must be carefully avoided. Cabbages are very injurious, and should be rejected. Pork and every species of hog's meat, black viands, game, salted or smoked fish, pilchers and anchovies are to be scrupulously banished. But animal food in general is by no means dangerous. Potage, a mixture of beef, white meat, vegetables, and ripe fruit constitute the best nourishment.

It is important to make use of good bread. Rye is not equal to the wheat bread; nothing can supply this last. The coarse and unleavened pies, eaten by the people in Hungary more than in Germany, are certainly very indigestible, as well as insipid; I do not doubt that, in this country, which is well known to me, it has contributed powerfully to the production of Cholera.

The quantity of food should be particularly limited. When taken too abundantly, it may occasion acute irritations of the stomach. M. Londe mentions that a Polish officer was attacked with Cholera Morbus after having eaten ten pounds of veal; another, after eating two pounds of sausage. This did not prevent it being said that they had received the Cholera from the Russians.

* Bousquet, Letter on Cholera, Paris, 1831.

Food that is too sweet must likewise be avoided, when even the stomach retains it well.

Pastry, sweetmeats, and very watery fruits are not proper. Rich food is still more injurious.

Very high seasoning, peppers, mushrooms and truffles must be rigidly abstained from. Horse-radish, leeks, onions, and garlic which the poor use so abundantly, for want of more agreeable seasoning, cannot but prove injurious to the stomach; they, therefore, must not be eaten.

Among the drinks, we should reject bad wine and sour beer. Good wine is to be used with great reserve, although it is considered to be a friend to the stomach. Brandy is one of those articles most susceptible of promoting the disease. It should be rigidly proscribed, as also the alcoholic liquors.

The water should be freed from any foreign animal or vegetable matter, as also from the salts or mud, which it may contain in certain localities; for this purpose, it will be necessary to have recourse to filters, charcoal, and re-actives. Those persons who digest badly when they drink water, should use wine. When even the privation of this drink would not be so painful, or injurious as they pretend, it is proper, however, not to make too sudden a change in their habits, at a time in which, from other causes, there is danger of experiencing a derangement in the digestive functions. But excesses of the table are to be carefully avoided. Wherever the Cholera has prevailed, it declared itself principally after some neglect of regimen.

Coffee, taken to excess, disposes to mucous vomiting; its use should, therefore, be discontinued, or it should be taken very weak, mixed with milk, and in small quantity.

For such persons as can digest it well, milk is an excellent aliment, capable of dissipating every incipient irritation of the stomach and duodenum. Those persons only who have a bitter and clammy mouth after using it, should abstain from it.

The skin should be kept clean and fresh by means of warm baths, more or less frequent, according to the constitution. There are but few individuals who understand how to derive the best possible advantage from this agent. It is true, they plunge and remain in the water, but their skin is not freed from its impurities, because they do not add the ingredients necessary to remove the grease which covers it, and because they neglect to practise those frictions the advantages of which were so well understood in ancient times.

It is essential to avoid all excess of fatigue, which produces those acute pains, and distressing pulling sensations in the muscles,

loins and vertebral column. The baths are very proper to overcome this painful state.

There is a cause of Cholera over which the lights of science, the resources of art, reason, and exhortation exert but little influence—chagrin induced by want of work, the loss of the usual means of subsistence, apprehension of future privations, and the despair which results from the loss of all hope of bettering the condition. Here philosophy can offer nothing more than words and maxims; to benevolence alone it belongs to heal these serious wounds.

The fear of contracting the disease, even before it prevails in the country, and more especially when in the midst of its destructive influence, should be carefully abandoned, whenever it presents itself. This is not so difficult as may be imagined, for it will suffice for this purpose, to reflect on the small number of persons affected, when compared to the whole population—on the non-contagious character of the disease, of which we cannot doubt at the present day, and finally on the advantages of a regular life under all circumstances.

Let it not be said that what has preceded is nothing more than ordinary language applicable to all diseases. There should certainly be a resemblance in all that is said relating to the preservation of a human being; but it is evident that, among the precautions just cited, there are some peculiar to Cholera Morbus. Moreover what does it avail? Was it imagined that a sort of vaccine had been discovered, which would preserve us from Cholera, as the vaccine does from small-pox? There is nothing trivial in placing eternal truths before the eyes of individuals, who are unacquainted with, who misunderstand or forget them.

Sobriety, cleanliness, firmness—such are the only preservative measures to be adopted against Cholera Morbus.

But the means of arriving at this result is not enjoyed by all men; there are some whom authority must control; and the civil authority owes advice, counsel, and exhortation to all citizens; it owes still more to some among them—namely, that which from their social situation they are precluded from enjoying. This will be the subject of the following chapter.

CHAPTER IX.

MEASURES TO BE TAKEN BY THE CIVIL AUTHORITIES FOR THE PURPOSE OF PREVENTING CHOLERA MORBUS, AND OF LIMITING ITS RAVAGES.

When the savage, ignorant and egotist as he is, perceives one of his companions to be affected with the small pox, he places a bowl of water near him, then flies and abandons him, in the desert, to the dangers of a hideous disease and ferocious beasts. Civilized man, whom fortune has bountifully supplied with her gifts, removes with no less terror from those places in which a disease prevails, which he believes to be contagious. The beggar and laborer, worn down by misery, or constrained to pursue their daily occupations, remain where their necessities have placed them, or in the midst of their neighbors and friends. What is the conduct of the reflecting being of an elevated mind and courageous heart, when those calamities appear, by which nations are destroyed? He feels that in the day of danger every citizen owes himself to his country; the advantage he derives from the blessings of education or the riches obtained from his ancestors, or which he himself has acquired, he willingly consecrates to the relief of the people whom social order, in her selfishness, deprives of the advantages of civilization.

What each citizen should do for his country by his intelligence and fortune, the government should accomplish with all the power conferred by the laws and finances of the state.

The sanitory measures are reduced to two principles:—1st, to dissipate the causes of insalubrity, which may exist in each place; 2d, to oppose any thing which would tend to their introduction.

The first consists in inspecting the quality of the aliments and drinks, in order that no unhealthy article of food should be exposed to sale; in removing all the animal, vegetable and mineral remains which by their mixture and decomposition, may alter the qualities of the air; in purifying the atmosphere by means of disinfecting agents, whenever it has undergone any change; in affording to the indigent, places of bathing elsewhere than in the river, where they are not willing to go, and where, moreover, they are prevented from plunging publicly.

The details concerning the application of these principles are immense. We have made some progress in this particular, but, as in many others, we are far from perfection. In our markets,

fruits are exposed for sale, which, in the villages, are given to the cattle : there are, it is true, inspectors of mushrooms for any one who is able to pay them.

The *charcuterie* and its incendiary preparations, whose name even is not understood by the happy ones of the age ; ragouts, and the different mixtures of the cooks exposed in the open air do not attract sufficiently the attention of the public authorities, and yet they conceal the causes of more than one disease, which obliges the hospitals to be opened.

The people are in want of a cheap drink, to replace the miserable wine, which the avaricious retailer sells them.

The streets should be washed and freed from the collections of filth ; the alleys and courts should be cleaned with great care, well paved and aired. The greater number of cellars contain all sorts of filth, which is never removed, unless the house should be rebuilt.

The privies are established on such a bad system that they render the houses of the poorer classes almost uninhabitable during the damp, cold, or warm weather.

There are, even in some of the finest portions of Paris, old houses, which have been entirely neglected as regards cleanliness ; their walls are ready to fall down from age, their chambers are infected, yards unpaved, and converted into sinks. In such places as these, cephalalgia and intermittent gastric irritations, are found to prevail, which sometimes assume a pernicious character : and if the Cholera should visit that capital, it will no doubt break out in the midst of this filth.

Baths, although now very numerous, are still above the means of the indigent ; it would be an excellent regulation if the municipal authority would have enclosures made on the river, and put the admission at the lowest possible price. I do not say that it should be gratuitous, for it is proper to let all men feel that the enjoyment of a social advantage must be attained by labor.

This will suffice to demonstrate that the health committees, recently appointed, will have a great deal to effect. They will also meet with a number of obstacles in the accomplishment of their duties—ignorance, prejudice and malevolence will oppose their researches. The administrative forms may retard the application of the measures they propose ; want of funds may prevent it in more than one case ; in a word, a proper change will be effected neither soon nor completely ; but there will be great merit in the efforts of those, who will undertake to accomplish it.

We are of opinion that these committees are not sufficiently numerous, and that every physician, administrator, and resident of

each *arrondissement*, should be invited to communicate with them respecting the general health.

It would likewise be nothing more than just that the members of the Academy form part of these committees in their respective wards. They cannot be too numerous, for, after all, they are nothing more than committees of inquest.

, So far from isolating and dividing men, particularly those of the same profession, and thus creating distinct parties among them, we should endeavor to unite them, in order that, knowing each other better, they may entertain less mutual prejudice, and thus contribute cordially in promoting the public welfare. Physicians are sometimes accused of allowing themselves to indulge in theories on different subjects which, among the public administrators, for example, are reduced to practical rules—it may be so. Therefore, if we place the theorists in contact with the practitioners, science and art cannot but gain by it, and humanity itself will find its advantage.

The measures, having for their object to prevent the introduction of morbific causes into our territory, are reduced to quarantines, lazarettoes, and the sanitory regulations. The application of these measures affects but a small number of diseases—some really, others presumed to be contagious. We do not include diseases, whose contagion cannot be called in question : such as the itch and different venereal affections. These maladies apparently being but little susceptible of determining death, it has been thought unnecessary to oppose their admission. In truth, there was an extraordinary degree of vigilance used when the privilege was without limit or control, but which at the present day would not be tolerated. This will, in some measure, explain the glaring contradiction which appears to exist, and which in fact is not less real than it seems.

At the end of this work will be found the instructions of the minister in reference to the application of the law of the 3d March, 1822.* It has appeared to us that the reader would be pleased to understand this part of our legislation, which at this time interests the whole world.

This law, which we ought cheerfully obey, is susceptible of certain modifications, which would not depreciate, but increase, perhaps, its utility. We have indicated them in a summary manner in the notes.

* The law alluded to is contained in certain police regulations, which have already been translated, and which consequently have been omitted in this treatise, as they have no immediate connection with the subject now before us.—TRANSLATOR.

Here, a serious question presents itself—is this law applicable to the Cholera Morbus? Thus stated, the problem is no longer within the domain of science; the only possible answer is the affirmative, for the text is explicit.

But, if it be true, that the Almighty has delivered the world over to our discussions, we should be permitted to submit legislative enactments to the lights of science, particularly at a time when the civil authority sends committees to distant parts,* invokes the aid of academies, and seeks for information with a solicitude, which fully testifies its zeal for the preservation of the public health.

Now, if it be asked—should the law of the 22d of March be applied to Cholera Morbus, let us reply that the Cholera is not contagious, as far as we can judge from the facts known and confirmed; that extreme prudence alone would require that the law concerning quarantines, lazarettoes, and the *cordons* be enforced in relation to Cholera.

However, this extreme prudence should have some limits; and as the law itself permits a discriminating exercise of the power it confers, let us not hesitate to say that, if it be conformable to the rules of prudence to adopt some precautionary measures in reference to foreign countries, it would require tolerably strong proof in favor of the contagion of Cholera Morbus, before we decide upon establishing quarantines, lazarettoes and *cordons*, in any of the internal portions of France, in which this disease might make its appearance.

This mode of executing sanitory measures would be followed by serious inconveniences—it would propagate fear, increase the number of persons affected with the prevailing malady, and add to the fatality of the disease. The truth of this was illustrated at Varsovie, in so remarkable manner that it could not be doubted; and this should be a sufficient objection to all similar measures, which, moreover, present other inconveniences which we have not named, whilst the advantages to be derived from them remain yet to be proved, since the Cholera Morbus has passed the barriers opposed to it by the Prussian and Austrian armies.

* Let us here mention the names of the courageous individuals, who have entered on this noble mission. M. M. Chamberet, Trachez, and Jacques, sent to Varsovie by the minister of war; M. Jacques died in a *lazaret* just as he beheld his country on his return; M. M. Londe, Allibert, Boudard, Dalmas, Dubled, Sandras, sent to Poland; and M. M. H. Cloquet, Gaimard, and Girardin, to Russia, by the minister of commerce. The Academy of Medicine will preserve in grateful recollection the memory of the session in which M. Chamberet presented them with a luminous description of his tour to Poland.

Let it not be said that there is an inconsistency in permitting a sanitory *cordon* on the frontier, whilst its establishment is prohibited in the interior. We do not recommend one more than the other; but we are aware that the government considers itself authorized to use extreme prudence as regards the relations between our country and foreign nations, because if the interests of some should suffer from it, others are protected, and besides, these measures seem to quiet the imagination of such as are always ready to exaggerate alarm, when life is endangered.

But it is above all important that to this, should be joined other measures, whose importance and greater utility are incontestible. They consist of three points.

1st, To complete the measures of public health;

2d, To increase the public charities, and facilitate the admission of the sick into hospitals;*

3d, To provide for the subsistence of the poorer classes, and furnish them with clothes and means of keeping themselves comfortable.

We have already spoken of the necessity of completing the regulations regarding the public health. This will be the more easily effected, if its accomplishment be confided to men who have made it the object of their profound study. It will have a double advantage, for it will afford employment to many individuals who are absolutely in want of work. It is important that all operations concerning the health of the community be directed by zealous men, who are capable of performing higher duties, but certainly none that are more useful. Plutarch considered it a great honor to be chosen inspector of the walls of his native city.

M. Londe has suggested the propriety of establishing institutions provided with all the necessary articles for giving water and vapor baths, practising frictions, collecting and transporting the sick; with physicians and infirmarians whose duty it shall be to administer on the spot, remedies to such as may be seized with Cholera. In these same institutions, there should be physicians always ready to proceed to those places, in which the disease may make its appearance. The object of these measures is to administer aid the moment it becomes necessary. The difficulties attending the execution of such a plan should not make us renounce it altogether. If the Cholera appears among us, the

* This idea was suggested to us by Dr. Londe; it presented itself to him in consequence of witnessing the sudden invasion of the Cholera, the rapidity of its progress, and the inefficacy of any treatment, when it was not employed at the commencement.

resident students and such as attend the hospitals daily, will render very important services; they will exhibit that generous enthusiasm peculiar to industrious youth.

To provide for the subsistence of the poor, to furnish them with clothes and fuel is a triple duty, which will demand considerable funds, zeal, and prudence. Public benevolence will secure the first point; for the second and third, it would be necessary to increase the number of commissioners, so that each one, having but a small number of houses under his immediate inspection, might acquaint himself with the situation of the poor, whom he would designate as worthy of assistance. There exist in Spain, if I mistake not, traces of a similar institution.

When I speak of food, clothes and fuel, given to the poor, I do not mean that they are to receive them as a gift, but rather as a salary, for the gift will be abused, whereas the salary will tend to encourage them. Indigence, to be relieved by public charity, should, in the first place, merit this kindness, by laboring to promote the cleanliness of the city.* Instead of indifference, distress, and idleness, a regulation of this sort would tend to produce an honest zeal and industry among the poor.

We should never give money until after the profitable employment of the body or mind; and when we are called upon to aid men enervated by privations or excess, we should administer what may be necessary, and avoid furnishing them with money, in order that it may not be improperly used.

There is an important point in regard to which it would be dangerous to err—to what extent should we give publicity to the documents relative to an epidemic? This is a matter for reflection, and it requires judgment and talent. In the first place, it is not necessary to divulge the preventive measures, which it may be deemed proper to adopt; the public voice will give them sufficient currency. In cases such as we are now treating of, it is of the first importance to assert the fact—because it is true—that individuals do not contract the Cholera Morbus in attending on persons who are affected with it. If the disease appear, the public authority should proclaim this circumstance, which, at the present day, is incontestible; it should then, during the whole course of the epidemic, occupy itself not with the publication of *chiffres*, the true meaning of which it is so difficult to appreciate, and which alarm the community, but it should remove daily and with all imaginable care, through the medium of instructions, counsels

* This idea has fixed, in an especial manner, the attention of M. Drapier, member of the committee on health.

and orders inserted in the newspapers, and placarded throughout the city, all the remaining causes of insalubrity, and all such as could possibly tend to develope the disease. There is yet another duty to be discharged not less important—it consists in combatting by the same means, with firmness and precision, the popular prejudices in relation to the origin, nature, propagation, and treatment, both prophylactic and curative, of the epidemic.

There are also certain energetic acts, which produce more effect than the press itself. Thus, the heads of the medical department in Moscow did not limit themselves to writing and talking about the disease; they visited the hospitals, and seated themselves on the beds of the sick, touched their hands, and respired their breath,* after which it did not require much argument to demonstrate to those in health, that the disease was not contagious, and to the sick that their affection was susceptible of cure.

Nothing of this sort will be wanting in France, should the Cholera Morbus come among us, for devoted philanthropists are to be found here, and our country is ever ready to reward courage under whatever circumstances it may be found.

* Zoubkoff, observations sur le Choléra Morbus, Moscow, 1830.